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Page

EUROPE'S PREWAR ENAMELING INDUSTRY	By Dr. Paul A. Huppert	13
FURNACES AND FIRING PROCEDURE —		
3rd of a Series	By Professor A. I. Andrews	17
PORCELAIN ENAMELED STEEL IN ARCHITECTURE	By Carl F. Block	19
SCIENCE LOOKS AHEAD	By Dr. Gerald Wendt	24
A "THREE-IN-ONE" PLANT SYNCHRONIZED FOR QUANTITY PRODUCTION — Part II, The Tile Line	By Claude Cleghon	26

Features

THE FINISH LINE — An Editorial	11
QUICK TRIPS TO ENAMELING PLANTS	28
PEOPLE YOU KNOW OR SHOULD KNOW — Strictly Candid	30 & 31
THE SUGGESTION BOX	33
FROM THE EDITOR'S MAIL	36

Ceramic Finish News

THE WASHINGTON ROUNDUP	By Wilfrid Redmond	29
INDUSTRY NEWS AND PERSONALS		37
PEI FORUM PROGRAM		39
CENTRAL DISTRICT ENAMELERS ENJOY GOLF AND CLAMBAKE		51

Miscellaneous

NEW LITERATURE	33
NEW SUPPLIES AND EQUIPMENT	34
ADVERTISERS' INDEX	60

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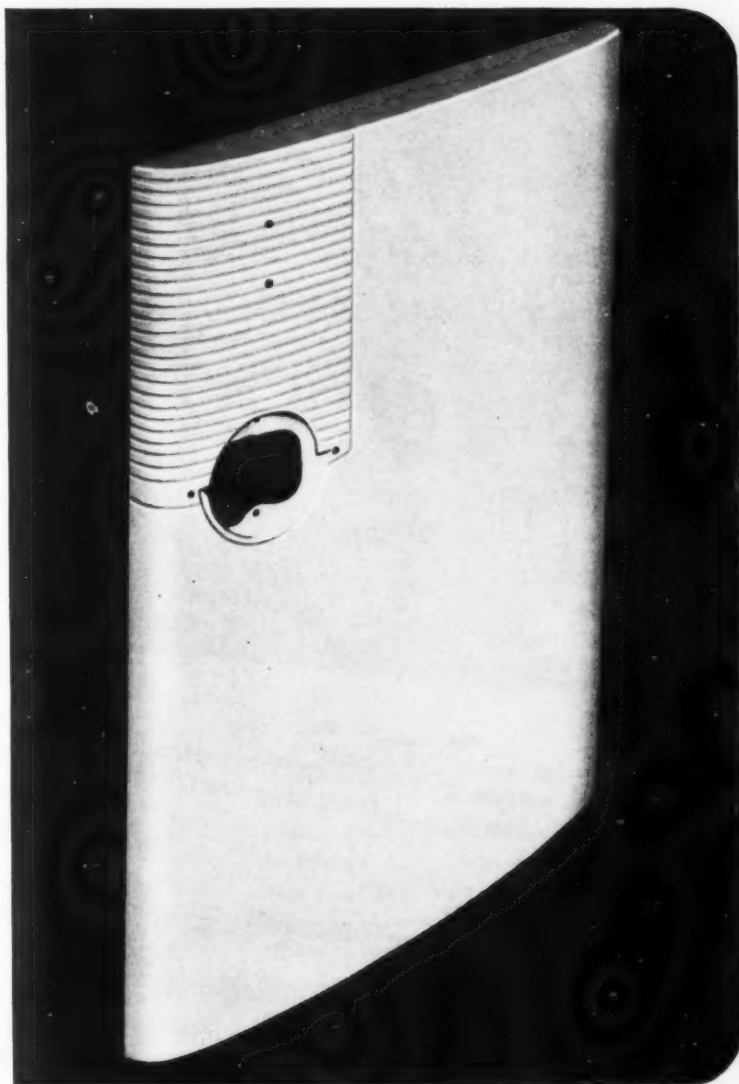
If it's a washing machine tub that you're making, or some other deep-drawn item, just name the requirements and the sheets you receive will draw freely without wrinkling or cracking.

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Guthrie Poultry Equipment Co. makes this blood testing cabinet with a Porcelain Enameled plate ruled into squares.

This plate is kept at 100° by a water tank soldered to the back.

The plate must be acid proof. The back must be free from enamel so that it can be soldered. It must be flat.

Naturally we were happy when Mr. Guthrie wrote the following:

"I personally want to comment on the plates we received. They were far superior to any we have ever had made. The Porcelain is practically chip proof, and the soldering acid does not mar the surface. I also noticed the plates were free from warp."

This plate is one of many jobs requiring special care which we are equipped to handle.

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VITREOUS STEEL PRODUCTS CO.

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THE Finish Line

ADVANCE WITH STEEL—is our recommendation to the porcelain enameling industry. The expanded use of porcelain enamel is tied hand in hand with the metal to which it is applied, whatever the application. Our present thoughts concern the trend to the use of more steel in the building field. In this connection, we recommend the reading of Carl F. Block's article, "Porcelain Enameled Steel in Architecture," starting on page 19 of this issue.

A boon to permanence

Whatever the trend may be as far as specific applications or products are concerned, there are few of us who would question that more and more steel will be used in construction of future buildings of all types. Where metal is used, the problem of finishes is ever present.

Although we have never advanced the idea of "covering the world" with porcelain enamel, there are unquestionably a great many logical applications in the architectural field that have not as yet been given serious consideration by our industry. Where applications *are* logical, porcelain enamel offers the *one and only* protective coating that may be considered permanent in the sense that architects refer to permanency.

We checked for ourselves

In the feature article referred to, specific reference is made to the River Forest Garden Apartments, River Forest, Illinois. These apartments are comparatively new, but they have been in use for about six years and this is long enough to check opinions and contrast finishes.

We talked with the architects, and visited the project and interviewed the building superintendent. While there are many unique features in this complete apartment layout which relate to steel construction, methods of heating and ventilation, natural lighting, etc., we were primarily concerned with the use of porcelain enamel in all of the bathroom interiors.

Said Fred Virgili, superintendent: "The porcelain enameled finish is entirely satisfactory, and I feel that its use will spread rapidly in buildings of the future. It is the neatest looking and easiest to keep clean of all available materials, and we feel it is much more permanent than other materials customarily used.

Said Henry K. Holsman, of the firm Holsman and Holsman and Klekamp, architects, "The porcelain enameled

bathroom interiors have proved eminently satisfactory. There is absolutely no deterioration after about six years. The material is without doubt the most practical that we have ever used for this purpose. We will continue to recommend it to our clients. I wish," continued Mr. Holsman, "that the building elevator interiors were also of porcelain enameled steel. It would eliminate wear and upkeep, and greatly improve their appearance."

It's only a start

This installation, and others throughout the country where porcelain enamel has been used effectively in modern buildings, represents a start in the right direction for the enameling industry and sheet steel producers as well.

There are many other applications equally as logical that are awaiting development. In the kitchen, for instance, let's go beyond the range, refrigerator and the sink, and develop the proper work top of light gauge steel, porcelain enameled and veneered to plywood, for all work surfaces in the kitchen. Let's work with the steel cabinet manufacturers to replace "baked enamel" finishes with porcelain enamel for apartment installations where the ordinary finish can't possibly "take it."

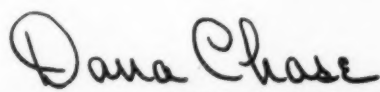
Our point here is not to outline all of the possibilities for using porcelain enameled metal in buildings of the future, but to emphasize the fact that the building business is "big business" and can not be treated as a "side line" by our industry if it is to be properly developed.

Team up for the future

It is our sincere belief that if only the most logical uses for porcelain enamel in the building field are properly developed, this phase of the business *can* be one of the largest single outlets for porcelain enameled metal. It is certainly to the advantage of both steel and enamel producers to "team up" in their approach to this problem.

Those enamellers whose responsibility it may be to produce the finished products can well use the backing of the large steel producers in attempting to "crack" so important a field. As the use of steel in building construction is expanded, there will be an increasing insistence on the part of architects that *permanent* protection be afforded.

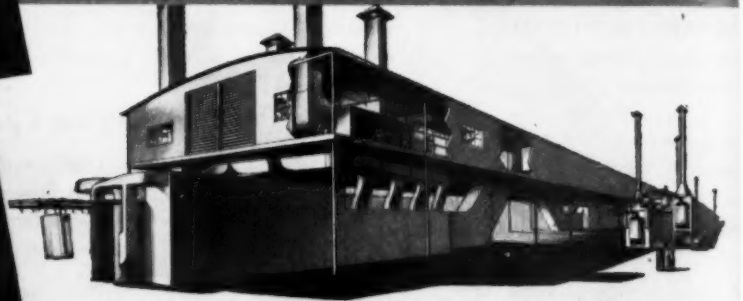
We say, "Let's team up for the benefit of all and do a big job in a field where the surface has only been scratched." The "hot dog stands" are a market, but with proper guidance, porcelain enamel will find its way into logical applications in the nation's great buildings as well.


Dana Chase
EDITOR AND PUBLISHER

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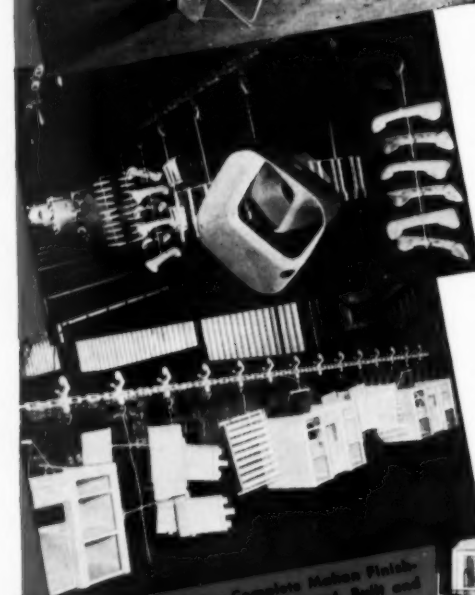
In the household appliance field, as in the automotive, tractor and farm implement, metal furniture, enameled plumbing-ware field, and many others, Mahon Finishing Equipment predominates . . . there are more refrigerators, stoves, washers, ironers, freezers, kitchen cabinets, radios, heaters, plumbing fixtures, and other miscellaneous household appliances, receiving their fine enamel finishes in Mahon Finishing Systems than all other equipment of this type combined. This preference, and the position of the Mahon organization in this highly specialized field today, is not mere coincidence . . . over twenty years of research and development, and close collaboration with production experts in every industry, has endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available to you elsewhere. Can you afford to gamble on equipment which so directly affects the unit production cost and the sales stimulating appearance of your product?

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MAHON

Europe's prewar enameling industry

describing plants, equipment and processes of the Czechoslovak "Sphinx" United Enamelworks, Ltd., plus information of historical interest to enamellers

By Dr. Paul A. Huppert • LISK MANUFACTURING CO., LTD., CANANDAIGUA, N. Y.



The first factories for manufacturing enameled steel utensils were built in Germany and Austria, and the families Haardt and Bartelmus started this industry in several places in Bohemia and Moravia, today the Republic of Czechoslovakia. Just around 1900 the various plants of these two families were merged to the "Austria" enameling concern, whose products became known all over the world. About 30 per cent of the enameling plants of the former Austro-Hungarian Monarchy were located in the territory of Czechoslovakia, and after the first world war when the Czechoslovak Republic was founded, the Czechoslovak plants of the former "Austria" Enameling Company became the "Sphinx" United Enamel Works, Ltd., using the most famous trade name of their products for the newly established concern.

In 1923, a new merger took place when the "Sphinx" acquired several other Czechoslovak former independent enameling companies, among them the large Haardt & Co. Stamping and Enameling Works, Ltd., in Nebocady, which as an independent company was one of the largest single plants for enameled kitchenware in Europe.

A multimillion dollar holloware business

Thus, the new "Sphinx" operated for some while eight individual plants, controlling more than 65 per cent of the total Czechoslovak production of enameled holloware, with a turnover of 6 to 8 million dollars a year, and being the most impor-

tant enameling enterprise in the whole of Europe. When comparing these figures, it should not be overlooked that the production costs and sales prices in Europe were far below American standards.

The general depression after 1930, spread also over Europe, forced the company to centralize its production by shutting down some of its less modern plants. On the other hand, with the boycott of Hitler's Germany in a number of export markets, the Czechoslovak "Sphinx" Company had a chance to conquer new markets, and to increase its export capacity.

In the years of 1936 to 1938 the export figures of "Sphinx" enameled goods exceeded the total of the enamelware exported by all German enameling plants together. By modernizing plant equipments and plant organization, production costs could be decreased, thus more ware was turned out and sold at competitive prices, at the same time reducing overhead due to the larger output.

In its final stage, just before "Munich," the "Sphinx" had organized its production of enameled ware in three main plants, each one of them employing between 1000 and 1600 workers.

Varying "qualities" produced for varying markets

The "Bohemian" quality was produced in Nebocady (Northern Bohemia) and consisted in a good, but cheap production of the general export class.

The "Moravian" quality originated in Brno, the capital of Moravia. There the highest grade ware, with the famous trade-marks "Elite," "Sphinx," "Niagara," "Eaglebrand,"

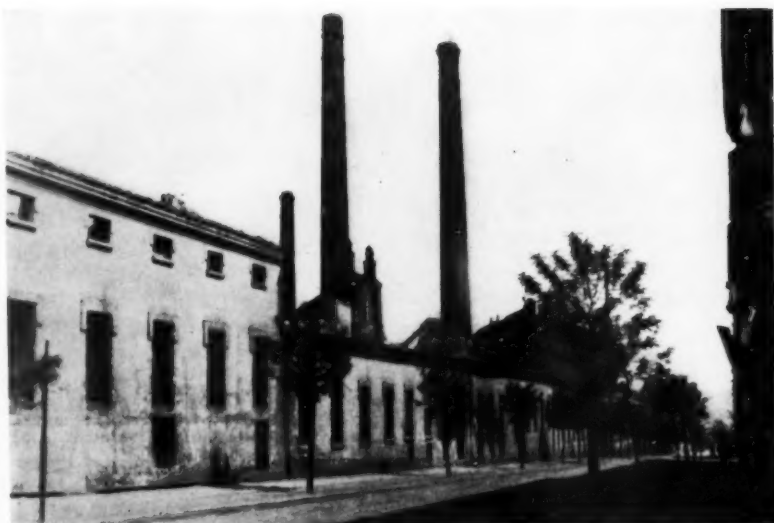
etc., were produced and exported to countries with high standards of living, among others to the United States, Canada, France, and Great Britain.

The "Slovakian" quality had been produced in Filakovo, a large plant located in Slovakia, close to the Hungarian border. This quality was an intermediary class of goods ranging between the high priced "Moravian" and the lower priced "Bohemian" ware manufactured by this company. This plant produced also flatware items, like kitchen stoves, and operated in addition a foundry, there at the same time enameling cast iron ware.

Three decades of development

During the first three decades of this century, two leading enameling experts were primarily responsible for the development of the Czechoslovak enameling industry: Gustave Spitz, former assistant professor of the Technical College in Brno, known for his work on borax, zirconium opacification, and de-enameling in autoclaves (Ger. patent), installed originally for the concern a Borax plant in Brno. Thus, they became the only enameling company operating their own borax plant until they had to shut down borax production during the first world war. During many years they also produced their own tin oxide and color oxides, especially cadmium selenide for red ware. Gustave Spitz developed the high grade of quality produced by this plant, and also introduced special lines, as enameled steel bath tubs, sign plates, highest grade of decorated ware, and finally stainless steel utensils.

The other well known European enameler, leading in the Czechoslo-



A prewar view of a section of the "Sphinx" United Enamel Works, Ltd., plant, BRNO (Moravia). Contrast this with the "after" view.

vak industry, was the late Alexander Huppert, this writer's father. Through many years he was president and general manager of the Haardt & Co. Enamelworks in Nebocady (Neschwitz). He organized his plant, among other lines of less importance, for export ware, using for countries with import duty on weight, light and extremely light gauges. The products became famous in the Far East, where the Japanese in later years even copied the Czechoslovak trade-mark of this company, the "H & C," and equally in South and Central America, as well as in French and British colonies. He was one of the first enameled who introduced,

as far back as in 1906, sodium silico fluoride in lieu of kryolite.

Kitchenware produced in two hours — from raw steel to packaging

In later years the plant in Nebocady became one of the first and few fully mechanized kitchenware plants. The production time for staple lines was exactly two hours from the time the steel was fed into the multiple press to the moment the ware, one coat white over ground coat, was ready for shipment, packed in crates or boxes.

The plant employed an average of 1600 workers. Three hundred and fifty girls were continuously working

in the decorating department alone. All departments worked in two equal 8-hour turns; only the furnaces and a few special equipments were used 24 hours through.

Of great importance among the features which distinguished the plant for mass production of export goods were the progressive presses with transfer feeders for making black shapes of cups, bowls, chamberpots, as well as the handles for these lines. The output on such items was up to 15,000 pieces per press and 24 hours. With each stroke such a press cuts out the circle from coil material, draws, trims, beads and throws out of the machine the readily made black shape.

When using thinnest gauges, as for instance .18 to .20 m/m = .0071 to .0079" = gauge No. 35 for 9" dinner plates, up to 8 pieces were drawn at one time.

A large department took care of electro-seam welding; longitudinal as well as round seams were used to fabricate complicated items such as tea kettles, bellied pots, pails, from thinnest gauges which could not be produced so in draw press operations. Due to good quality of the steel, only 5 to 7% of the total assortment had to be annealed during drawing operations.

Simplified "pickling" procedure

With exception of this small portion of the output that had to be pickled in tanks, by using muriatic acid for this purpose, the entire remaining assortment passed a flat belt conveyor spray washing machine, with an alkaline washing, rinsing with a weak solution of soda ash, and a drying section. The entire length of such a machine has been about 35 feet, the width of the belt being 4 feet. This installation took care of a production between 4,000 and 5,000 single pieces per hour. When this machine was introduced in 1928, about 75 workers of the former scaling and pickling department were released for other work. One of the greatest advantages of this machine has been the elimination of dents, especially important on the thin gauges, and thus the reduction

View of a section of BRNO plant showing extent of destruction.



of the dinge knocking department. Flat items had not even to be inspected any more.

All welding of attachments was done after cleaning.

Three continuous and eighteen box type furnaces

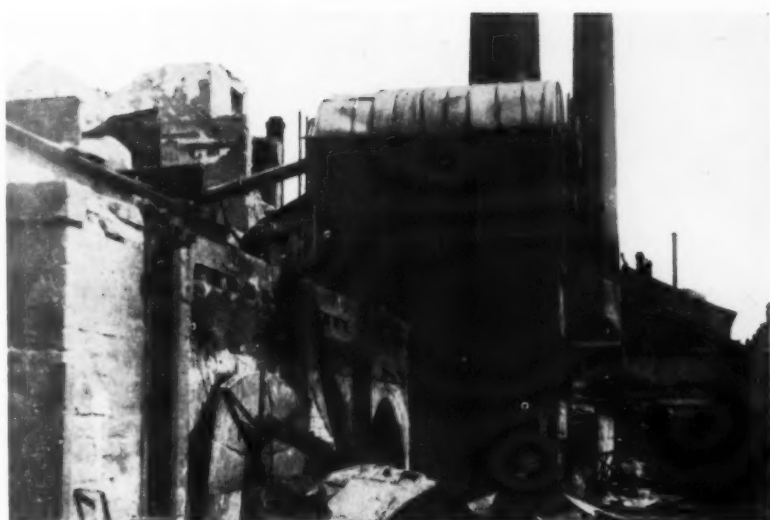
The plant was equipped with three continuous furnaces, operated by producer gas, one of them of the straight through type. The output of each furnace amounted to 3 to 4 tons of once-fired ware per 8 hour shift, thus being more of the size of a small U-type furnace. Of course, one of the furnaces was continuously burning ground coat, never changing the temperature, but only varying the speed according to the gauges.

Out of the additional large 18 box type furnaces, only a few were operated, mostly burning the decorated ware, which in normal times amounted to about one-third of the total production.

Ground coat was slushed on the furnace chain without any preceding drying. All the other slushing operations or spraying work were followed by drying in continuous dryers, partly of horizontal, partly of vertical construction. The latter type had preference on account of floor space saving and combustion economy, especially for the output on multicolored ware. The inside of the articles were first slushed white or pearl, dried in the vertical dryers, and then immediately dipped outside, thus burning both colors at the same time.

Finished ware that had to be straightened were also handled on the continuous furnaces. A special door at the end of the burning chamber permitted the removal of these pieces from the chain for stamping them, instead of reburning them in a box type furnace as very often practiced here. Burning tools were made out of rolled material of Czechoslovak origin, its analysis similar to the 18/8 type stainless steel. Air curtains were used to seal the muffles, and on the straight-through type furnace hot air was transferred from cooling to preheating part.

Spoiled ware in the bisque was



Ruins of box type furnaces and a vertical dryer that transported ware from the upper floor (dipping department) to the burning floor.

washed in little spray washing machines, and repair of a certain type done by sandblasting and respraying.

In the decorating department, girls were placed along flat belt conveyors so that each following operator could add another color to the decorations. The larger part of decorating was stencil spraying on the bisque. For this purpose the film strength of the enamels had to be especially prepared.

Raw material sources

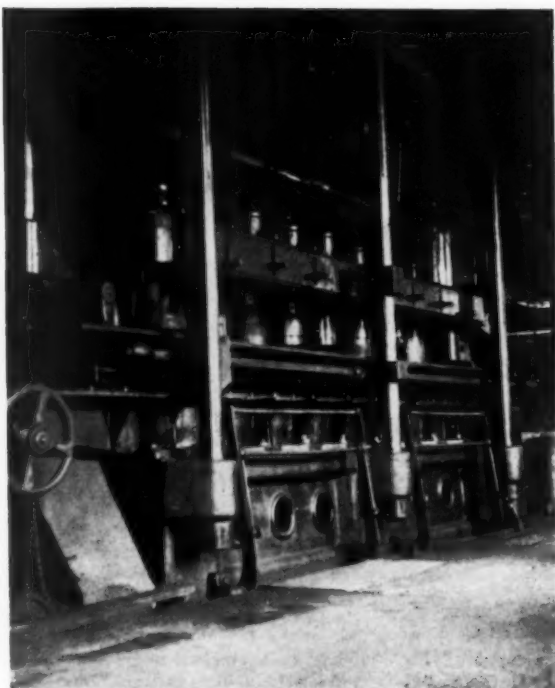
The frits were smelted in rotary smelters after briquetting the mixed raw materials, which procedure was equivalent to a saving of 7% loss,

especially stack loss due to draft. Rasorite, imported from the States free of duty, instead of borax; sand in lieu of quartz; Bohemian feldspar; and exclusively sodium silico fluoride were used as main raw materials. According to Czechoslovak laws, the use of antimony, copper, barium, zinc and other analogous compounds was prohibited in cover coat enamels.

Large mills were preferably used for ground and white enamels. Numerous large storage tanks made out of cement made it possible to age the enamels, before applying them, up to 2 and 3 weeks. This was especially important in connection with

"Leftovers" from what was formerly the black shape storage room.





A German-made multiple press with transfer feeders as used in Czechoslovakia. The press photographed was later completely destroyed. Dr. Hupfert describes production methods and covers fabricating procedure and production results in this article.

the use of the gas opacifier (Kreidl GTM). Staple lines were enameled in light ground coat, based on antimony. The mills were loaded from overhead platforms, and the water additions were checked by automatic meters.

The finished articles were packed in large wooden crates or plywood boxes manufactured by the company. They also operated their own plant for making wood shavings, the only packing material used for export.

The daily output amounted to an average of 10 tons of finished enameled goods, or more than 60,000 pieces. Thus, the average weight per piece was below $\frac{1}{2}$ pound. This extremely low weight for regular utensil assortment was due to the extra light export gauges used. While the lowest gauges used for fabrication were mentioned before with gauge No. 35, the average gauge used was between 29 and 30 in this plant.

As to combustion economies a very well planned system was kept throughout the entire plant. The factory operated its own up-to-date high pressure power plant and its own gas producer. As fuel they used small sized Northern Bohemian bituminous coal which was brought by trucks from the mines, only 25 to

30 miles away from the plant, and directly emptied into underground silos; from there the coal was elevated by an automatic conveyor into high bunkers from where the automatic stokers were fed. No live steam was used for any purpose other than to produce electricity. The exhaust steam went into the washing machine, gas producer, and in winter time for room heating.

The tar from the gas producer was pumped into cisterns and used for heating the smelters.

All dryers throughout the plant,

including the one on the washing machine, were operated by the waste heat of the burning furnaces through built-in hot air exchangers. There was no fuel wasted in any corner of the plant, and the fuel consumption was centralized in only two places: the power plant and the gas producer.

After this description, it will become obvious that the Nebocady works (formerly Haardt & Co. Ltd.) was not only the largest individual European enameling plant, but also one of the most modern in prewar Europe.

Brno works used heavier metal — five to seven burnings

The Brno works was more distinguished by the high grade of quality of its products, and its specialty lines. This plant produced in normal times, with about 1,000 workers, 10 tons of enameled ware per day; however, not more than 25,000 pieces. They used heavy gauge enameling stocks, for certain items even up to No. 12. As Europe has not had specialized flatware enameling plants, this factory turned out besides the regular enameled kitchen and hospital lines, enameled steel bath tubs, sinks, refrigerator linings, sign plates and the like. They also had a full line of highly polished stainless steel ware, under the trade name "Nonoxide," made primarily of British material, but also using some of Czechoslovak origin. Another specialty was the

to Page 56 →

Chamber, cup, plate and saucepot as manufactured in Czechoslovakia for export to South America and other countries. Other styles of Czechoslovakian ware are of intricate design patterns in many colors.



Furnaces and firing procedure

third of a series of six detailed articles on drying and firing procedure

By Professor A. J. Andrews • ASSOCIATE EDITOR

ALTHOUGH it is sometimes possible to fire different enamels together with the same furnace conditions, each enamel does have a best combination of firing temperature and time. Anything else is a compromise, sometimes important and sometimes not. In the development of commercial enamels it is, therefore, sometimes necessary to adapt them to certain furnace conditions rather than adapt the furnace conditions to them. Enamels, for example, which are to be fired in a box type furnace must perform best with a quick, hot fire since they are charged directly into the furnace at maximum temperature. With a continuous furnace, however, enamels should be selected which fire best when gradually heated to the furnace temperature and are then gradually cooled down. In the firing of sheet steel ground coats this difference is great, as there must be a period preceding fusion of the enamel in which the iron oxidizes just sufficiently for that particular enamel.

Several phenomena follow each other in all sheet steel ground coat firing. During the heating up period the oxygen in the furnace atmosphere passes through the dry bisque enamel coating and builds up a layer of iron oxide between the enamel and the iron. This oxide layer is necessary to the development of adherence. Following this, the enamel surface melts to a continuous layer but the underside of the enamel coating remains porous. Fusion proceeds further and then gases rise from the interface between the enamel and the iron. This results in a violent boiling of the enamel layer but as the temperature rises further, the boiling subsides and the glass fines itself. The larger bubbles come to the surface and break. The smaller ones

could only be removed with long heating. A uniformly distributed small bubble structure is desirable and when such exists the enamel is properly fired. These phenomena cannot, however, be seen by the plant man when he fires a load of enamel ware. He sees the glass melt, the rough surface caused by the boiling, and finally the smooth gloss of the properly fired ground coat. A color change also takes place as the enamel heats; the gray color as it enters the furnace changes to a black, to a dull red, and finally a bright red. After firing, each ground coat has a characteristic blue to black color and appearance which signifies good fir-

ing. This is only learned by experience with the particular enamel.

Sheet steel ground coats, in years past, have required firing temperatures of about 1600° F., but with the development of multi-frit ground coats, the temperature for satisfactory firing of some enamels has been decreased to about 1500° F. Although it was at one time thought that ground coats necessarily had to be fired at a higher temperature than the cover enamels, some production plants are now firing both ground coats and cover coats together in the same furnace. This practice has certain advantages in routing the enamel in the shop, and eliminates the ne-

Table III⁽¹⁾

PRODUCTION CAPACITIES OF PORCELAIN ENAMELING FURNACES

SIZE	5 Ft. x 12 Ft. Box Furnace	7 Burner Continuous	9 Burner Continuous
PRODUCTION Sq. Ft. 20 ga. ware Cover Coat Burning	400 - 500 per hr. 1:4 ware- tool ratio	2000 - 3000 1:1 ware tool ratio	3000 - 4000 1:1 ware- tool ratio
HOLLOWARE Units per hour, 10-in. Dia. x 5-in. Deep	500 - 700	2000 - 3500 80 ft. Pre- heat	3500 - 4000 80 ft. Pre- heat
CAST IRON Pounds per Hour	800 - 1000 Multiple Decking	3400 - 3800	4500 - 5000
AVERAGE OIL CONSUMPTION U.S. Gal./hour 28° Baume	16 - 18	31 - 35	40 - 50
AVERAGE GAS CONSUMPTION CFH 1050 BTU 550 BTU	1500 - 1800 3000 - 3600	3000 - 3500 6000 - 7000	4000 - 5000 8000 - 10000
CHAIN SPEED Ft. per min. Cast Iron Ground Coat 1580° Cover coat 1520°	2 - 500 lb. loads/hour 10 loads/hour 14 loads/hour	1½ - 2 8 - 9 10 - 14	2 - 3 15 - 16 18 - 24
HOT ZONE TRAVEL		40 feet	50 feet
AVERAGE LENGTH		82 feet	90 feet

cessity of considerable process storage, particularly where a continuous furnace is used.

In the firing of sheet steel cover enamels, the differences between firing in a box type and continuous furnace are not so great. In general, the time a cover enamel is conveyed through the hot zone of a continuous furnace is longer than the time it is fired in a box type furnace. The most desirable temperatures and times or conveyor speeds must be determined as with ground coat enamels, but the range for good results is generally much broader for cover enamels. Cover enamels do not pass through the violent boiling stage described in the firing of ground coats. There may, however, be some reboiling and a tendency to tear. This tearing is controlled by the preparation of the enamel slip rather than in the firing process.

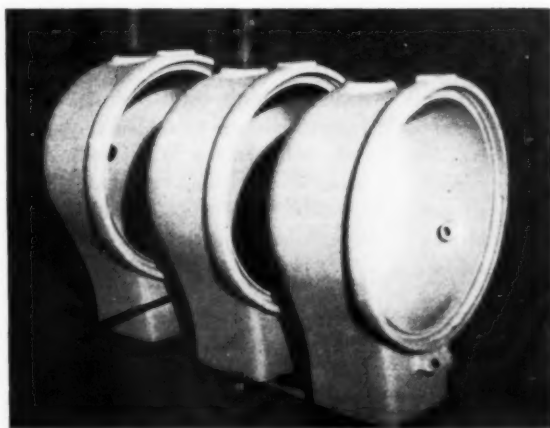
Most cover enamels are fired to a good bright gloss. Underfiring tends to give a matte surface while overfiring, particularly if the temperature is too high, causes pin holes, a loss of gloss and reflectance. Cover enamels which are to be decorated with screen stencils, grain finish, decals, or a printed design, should never be overfired as the condition would be

further aggravated by the decorative firing.

With either ground coat or cover enamel, the furnace atmosphere must be free from injurious gases such as water vapor and sulphur. In cover enamels, the gas causes a loss of gloss and a greasy, fuzzy appearance.

In the firing of wet process cast iron enamels, the conditions of temperature and time depend upon the enamels, the results desired and the weight and shape of the ware. Some cast iron ground coats are fired to a glossy condition and some are fired only to a dead matte. Since most cast iron ware has considerable mass, it can not be fired fast at a high

to Page 56 →



An integral model CO₂ recorder—a type suitable for use on porcelain enameling furnaces.

PHOTO COURTESY THE HAYS CORPORATION

In the firing of wet process cast iron enamels, weight and shape of the ware are important factors affecting firing temperature and time.

Some production plants are now firing ground coat and cover coats together in the same furnace.



Porcelain enameled steel in architecture

an outline of present uses and a vision of what the future will bring

By Carl F. Block

MARKET DEVELOPMENT DIVISION, CARNEGIE-ILLINOIS STEEL CORP.,
UNITED STATES STEEL CORPORATION SUBSIDIARY



The use of porcelain enamel on steel in architecture has developed during recent years to a point where it is now beginning to receive greater public recognition. The Porcelain Enamel Institute has created an Architectural Section to handle the problems and guide the path of this fast-growing material. This section, made up of the interested members of the Institute, has established specifications for porcelain enameled sections in architectural applications. This information has received wide distribution among potential users.

A few years ago it would have been impossible to find a reference to porcelain enamel in any building code of the country. Recently the Building Officials Conference of America established a building materials veneer committee, which has written a veneer code section which contains a section on porcelain enamel veneers. This veneer code section has been adopted by the Building Officials and is being written into the various building codes of the cities. Material manufacturers, as well as those directly affiliated with the industry, are expanding their activities in this field.

The building industry, both residential and nonresidential, can be expected to develop a huge volume in the next few years. The steel industry looks forward to a big market both in this new construction and in the equipment involved.

Operating at 82% of capacity, in 1940 the steel industry produced 67,000,000 tons of ingots. New facilities, added during the past four years, plus new operating techniques, have raised total steel production to an

estimated 95,500,000 tons of ingots, based on 100% operation of the facilities available today.

The twenty-year average of home construction between 1921 and 1941 was 439,000 units. Nine hundred and twenty-three thousand units were built in 1926, due to a building boom, but only 77,000 units were erected in 1934 as a result of the depression. Since that date, until our entrance into the war, recovery has been steady, every year showing an increase over the preceding one. The need for new homes is urgent. It is estimated that during the next ten years we must build at least a million new homes a year. No one can deny that the market exists; the task of the building industry is to provide the new, attractive and economical homes that the public wants.

The properties of steel make it ideal for many uses in home construction. It is easily fabricated, readily available, adaptable to numerous methods of finishing and, finally, it is economical. These properties have led to experimentation with steel houses, with varying degrees of success in the past. Based on a study of the various experiments, the following four features stand out as being essential to the success of steel housing construction.

Features essential to successful steel housing construction

1. Public acceptance must be developed before any major changes can be made in housing design or in materials. This is a major problem but public appreciation of the value of changes may be greater now than before the war and the educational process may be easier. Previous educational efforts have had a chance to be evaluated and it is to be expected that advances in design and

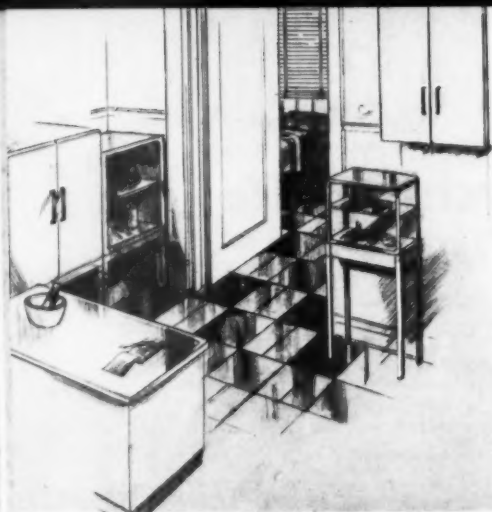
appearance will be such as to make public acceptance of a greater use of steel in home construction easier now than before the war.

2. Infiltration of air must be prevented because of its effect on appearance, cost of maintenance and cleanliness. This is a problem which can be solved by good design and proper fabrication.

3. Heat conductivity (through exterior walls) is of vital importance. This loss of heat directly increases costs, and the effect of condensation on interior surfaces raises the cost of maintenance. This problem has been solved by interrupting the continuity of heat conductivity through the walls and holding heat loss within reasonable limits by the use of insulation.

4. The fourth feature for consideration is the direct replacement of several materials performing different functions by a steel unit performing these combined functions. Up to this time, most attempts to introduce more steel into housing have chiefly been efforts to demonstrate the value of steel as a material on the basis that the improved quality of the construction justified the increased cost. Usually there is no attempt to take full advantage of the wide range of properties of the metal and the many uses to which it can be put. Now, however, steel is being used on its own structural merits and the designer and builder have much greater freedom than in the past. Modern data, supplemented by experience, justify code officials in granting this freedom and much may be expected from the building industry working in cooperation with manufacturers and fabricators of this well proved basic metal.

Modern steel construction is suitable for use in homes either with or



without basements as may be required, so no unusual foundation problems are encountered. Steel floor units are fabricated from steel sheets formed into panels which can be bolted directly to the foundation. Over these smooth rigid panels a mastic top coating is applied and into this is set wood block flooring or linoleum. When a basement is not provided, these floor panels are well insulated.

To the floor units will be attached vertical steel panels designed to provide the desired insulation and smooth wall surfaces and also the strength required to support the second floor or roof. These panels will be of room height, and probably 16 inches wide, factory assembled into groups of three sections to give a four-foot module for easy erection. Other panel groups or modules will contain window and door sections and probably modules with self-contained sliding doors will be available.

No limitation to exterior treatment

The exterior of one of these modern houses can be of any familiar acceptable material such as stone,

brick or wood, combined with porcelain enameled panels in harmonizing color and various textures. Windows will have steel sections and frames. Sills will probably be made of porcelain enamel on steel, with receptacles to collect any moisture produced by condensation due to the airtightness of the steel construction. Interior wall panels for separating rooms, replacing conventional walls, can be designed and constructed to provide useful storage space, shelves and cabinets. A linen cabinet has been designed to replace a wall section and provide space for towels, cleansing tissue, toilet tissue, soap and accessories, medicine storage or a clothes chute.

Buildings constructed of steel panels are no idle dream. Many buildings have been erected in various parts of the country, using steel panels as building units, even in large apartment buildings. One such building in River Forest, Illinois, has 281 apartments and has proved to be very economical to heat and maintain.

After people have learned to live with steel in the interior of their homes, the problem of exteriors will solve itself.

Many uses for porcelain enamel

Flat roofs can be of normal roof construction with gravel stops of colored porcelain enamel on steel. Gable roofs can also be constructed, if desired, of light steel framework or pan construction covered with porcelain enameled clapboard-type steel roofing sections. A considerable number of roadside restaurants and service stations have used porcelain enameled steel shingles. An interesting example of clapboard steel roofing and siding is the housing project near Hammond, Indiana, where a number of houses have been built with these roofs.

The lighting problem can be solved by light troughs around the ceilings, also incorporating a picture molding. Someone has said that the trouble with a steel house is that you need a drill to hang a picture. A stainless steel picture wire suspended from the molding will accomplish the same purpose, although one of our elec-

trical friends has suggested a small permanent magnet.

Steel stairs are now available for use in homes. Stairs with pressed treads and risers, shop welded and installed complete with tread coverings cemented in place, offer an attractive and economical addition to the uses of steel in homes.

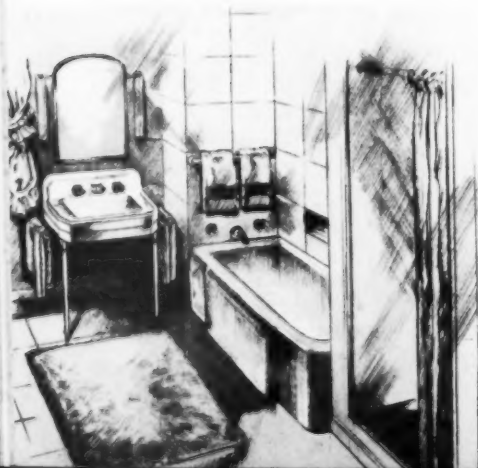
A number of manufacturers are now working on several types of steel doors for residential use, which will soon be available as complete units. One novel design suggested by a decorator is an interior door of steel sheet construction, perforated with floral designs and coated with colored plastic or glass sheets. This presents a pleasing new development, adding transparency and color to a new item in the home.

Lath and plaster interior walls are usually wasted space. With a steel panel construction, however, cabinets can be extended to living room and dining rooms, which can be equipped with steel bookcases, dish and glass cabinets in place of space consuming walls.

Bedrooms in the new steel house would be designed with two adjoining rooms with a complete cabinet between instead of a space-wasting wall. The cabinet would be divided to serve each of the bedrooms and would extend from floor to ceiling, providing space for all types of storage including the usual clothes and drawer spaces. These clothes storage spaces would have doors on piano hinges or sliding doors. Being practically air-tight, they would be ideal for moth-proof storage of blankets and winter clothing. The architects on one of the larger housing projects are considering such an application.

Bathrooms are a "natural"

Bathrooms offer an opportunity for displaying the full range of colors and finishes — porcelain enamel on steel tile or panels used both in the walls and ceilings. Pressed steel bathtubs, lavatories, and shower stalls made of porcelain enamel on steel and furnished in colors to harmonize with the walls are now available. Medicine cabinets are now on the market manufactured of beautiful



porcelain enamel on steel. There are also possibilities of stainless steel toilets—many of you have probably noticed them on some of the newer Pullman sleeping cars, they have proved very successful and economical. These toilets are to be provided with porcelain enameled casings to provide a complete fixture in color.

Complete steel kitchen ensembles an actuality

The kitchen has already responded to steel. Long before the war, complete steel kitchens were on the market. New types of cabinets will soon be available in new designs and new finishes. Pressed steel sinks of porcelain enamel on steel with bowls and drainboards, as well as wall tile, will be available. Colors on steel cabinets, stoves, refrigerators, and equipment will all be uniform as tested by newly developed color meters. The subject of color harmony has been carefully studied by the paint and enamel companies and large users of both paints and porcelain enamels.

New designs in stoves—electrical, gas, or oil—will help make cooking a pleasure. Steel kitchen tables, chairs, ventilators, garbage disposers or containers and every conceivable type of steel equipment will soon be available. One company has done considerable work on an induction type of roaster and oven that will cook food uniformly in a matter of minutes. Food preservation will be simplified by new types of refrigerators, quick freezing units and centralized locker stores, all made from steel.

The laundry and utility rooms

Laundry facilities represented by both standard and completely automatic machines for washing, rinsing, and partial drying have been available in the past. Many new improvements will be seen in the new models. Drying equipment and ironers are ready for manufacture. Hot water heaters have been manufactured for some time with porcelain enamel on steel tanks. More efficient, better-designed models will be presented to the public.

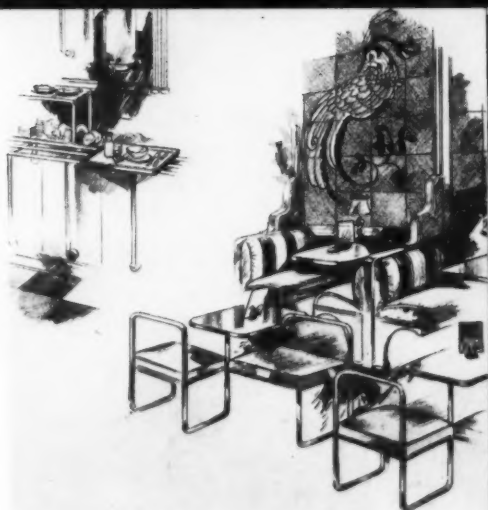
The heating, cooling, and air conditioning equipment in this steel home we are discussing will provide indoor comfort, the like of which we have never experienced. Electrostatic dust precipitators, air filters and air washers will provide dust, pollen, germ and odor-free air for our homes. These will be a boon to the many hay fever sufferers and lift much of the drudgery from the busy housewife.

Radiant heat is also in prospect for the American home owner. Steel walls, floors and ceilings provide the ideal medium for applications of this type. Hot air, electrical tube, steam or hot water types of heating equipment are all equally adaptable for radiant heating. One system circulates air at 130° above a suspended ceiling. The heated air heats the ceiling which in turn radiates its heat to the persons and objects in the room below. Other new systems have been developed using steel baseboard or cornice panels of a room to circulate the heating medium. In England and France large panels have been placed on walls or suspended in rooms to provide radiant heating. These last three types of radiant heating can be applied to existing buildings as well as new construction and may find considerable application in the future. New types of heating regulators assure steady, uniform heat throughout the home.

New steel furnaces—coal, gas or oil-fired—stokers, fuel tanks and steel flue liners, all contribute their share of comfort and convenience. Before the war, the average home was fast becoming a steel-equipped home. Now, steel prefabricated parts of the home will finally evolve into the complete steel home unit. Not all of this is expected in one year or two years; the trend, however, is definite.

Suitable for mass production

Thus, we find that steel has many uses throughout the home, its facilities and equipment. Each application must be specially tailored for the job it has to do. Since steel is easily fabricated into identical sections, it lends itself readily to mass



production. This system of mass production has given us the automobile, the washing machine and the refrigerator, as well as thousands of other products which have helped to give this country the highest standard of living. Eventually, we may see housing sections mass produced in steel.

Industrial buildings have also changed rapidly in the past few years. Huge manufacturing facilities to construct aircraft in mass continuous production have required high, wide, spaces in buildings of tremendous lengths. Steel panel construction has been utilized to produce one of the building marvels of the war in these modern bomber plants.

Straight-line, one-story production structures offer industry economies and efficiency never realized before. These buildings have covered from ten to more than fifty acres, each constructed with steel frames, steel roofs and steel sidewalls, many being windowless. Uniform one-piece panel construction is easily erected, clean-cut and beautiful. It may be expected that such buildings will lead a trend to better designed industrial





BATHROOM PHOTO,
COURTESY PORCELAIN PRODUCTS CO.

buildings. Exterior decorative features at the entrance or office section have made some of these buildings outstanding in appearance.

Hospitals and schools should use porcelain enameled steel

Hospitals and all types of educational buildings lend themselves particularly well to the use of porcelain enamel on steel. Exteriors and interiors will be of fire-resisting steel. Blackboards of steel, unbreakable, easily cleaned, and new motion picture screens for visual education have recently been developed which will give approximately the same reflectivity as the screens now used.

Interiors and equipment made of fire-resisting steel will not burn. Every pound of combustible material eliminated from buildings reduces the fire hazard, thus leading a trend toward safer, more easily maintained school and public buildings.

Commercial buildings will also use much steel in the future, not only in the supporting structure but also in the interior and exterior as well. Large numbers of small commercial buildings, gas and service stations, small restaurants, roadside stands of various types, ticket offices, bus terminals, store fronts, theatres and numerous other buildings have been constructed with exterior veneers and



structural exteriors of porcelain enameled steel finishes in every color of the rainbow. These buildings require a minimum of expense and effort to maintain in a clean and attractive condition. Construction of this type of building will expand.

For multistoried buildings too

The larger types of commercial buildings offer interesting opportunities. Besides the basic skeleton requirements of multistoried buildings, steel floors, ceilings and sidewalls offer new and continued uses for steel. To keep commercial buildings modern and rentable requires sufficient conduit space for electric wiring for business machines, telephones and communication systems. Unlimited facilities for these are provided in steel floors. Steel walls and steel ceilings can carry the heating, air-

River Forest Garden Apartments, River Forest, Illinois, built in 1940, offer an excellent example of the extensive use of steel for this type of building. The 281 apartments in this project have served as an excellent proving ground for many innovations in modern apartment construction. All of the bathrooms have porcelain enameled steel wainscoting in panel type units. According to the architects, building superintendent and tenants, this feature has proved eminently satisfactory from the standpoint of appearance, cleanliness and permanence. (See "The Finish Line, page 11.)

SKETCHES ON PAGES 20 AND 21 ARE FROM THE NEW CARNEGIE-ILLINOIS STEEL CORP. BROCKET, "PORCELAIN ENAMEL ON STEEL IN ARCHITECTURE."

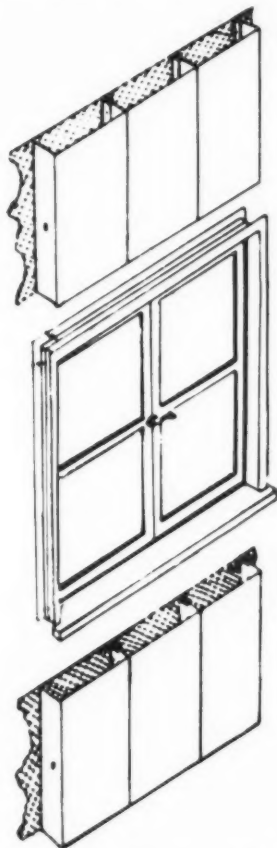
conditioning and utility systems for the building. These steel surfaces are easily cleaned and will take any of the modern finishes.

Heavy steel construction has been successfully used for many years in every type of application. Recently, many new types of lightweight steel construction have come into more general use. These have met the exacting requirements of National Defense and of the War Program.

These lightweight steel applications include steel joists, steel windows, steel stairs, steel lath, mouldings, steel veneers, cold formed steel studs and shapes, steel floors and many other products. All of these products are used because of proved advantages in service, durability, strength, incombustibility and economy. Most of these are not new. They have, moreover, been proved by long service in mechanical equipment of all types, as well as in building construction.

The American Iron and Steel Institute sponsored a survey of types of lightweight building construction and engaged the Pittsburgh Testing Laboratory to make an inspection survey and report their findings on a considerable number of applications in buildings ranging in age from ten to thirty-five years. The report shows that the installations gen-

erally are in excellent condition and are structurally sound, and concludes that properly protected lightweight steel construction under normal con-



Window construction detail.

ditions may be expected to retain its structural properties for the life of a building.

With the increased use of steel veneers in various types of buildings, several architects and engineers have discussed the possibilities of approaching the problem of covering the exteriors of multistoried buildings with steel panels. This development holds considerable interest because of the many advantages involved. Steel exteriors of commercial buildings will gain recognition by evolution rather than by revolution. In the early 30's, we saw stainless pilasters running up the exterior of multistoried buildings such as the Empire State Building in New York City. Other towers and spires have been completely covered with stainless steel. Spandrels of porcelain enameled steel, as well as other metals,

have been used on many buildings.

Functions of an exterior wall

Ever since the old castle-type constructed wall-bearing building, walls have been from twelve to eighteen or more inches thick. In modern curtain wall construction, the principal functions of exterior walls are to protect the interior from the elements, to provide a reasonable degree of heat insulation, and to afford adequate fire protection. Only enough strength is needed by the wall to carry its own weight and assure the necessary stiffness, as each floor and its load is supported by the structural framework of the building. If proper safety is provided, all these wall functions could easily be taken over by double-walled insulated steel panels, thus greatly decreasing the weight of

steel. Too slavish simulation of familiar finishes should, however, be avoided as the new materials possess architectural merit of their own which should be utilized. These changes in modern buildings will be slow, but certain, as their use and economy are proved.

Limitless possibilities

Porcelain enamel on steel can be used on innumerable types of construction. It is also readily adaptable for use in conjunction with other building materials. These features are being recognized in an ever increasing extent and will eventually give our people better and more pleasing places in which to live and work.

The extent of its use is limitless—on the farm, in our homes, in our

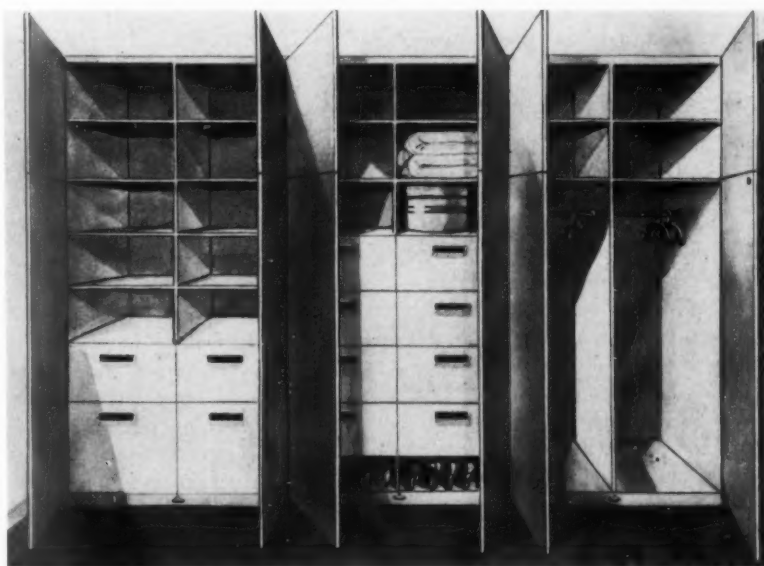


PHOTO COURTESY U. S. STEEL NEWS

Bedrooms in the new steel house will be designed with two adjoining rooms with a complete cabinet between instead of a space-wasting wall. The cabinet will be divided to serve each bedroom . . .

the outside walls and holding material costs to a minimum, while at the same time simplifying foundation construction.

The appearance of the outside of such a panel-constructed multistoried commercial building would be little changed from its present appearance. Outside coverings practically duplicating the appearance of present type materials can be produced in the modern porcelain enamel coatings for

factories, churches, schools, stores, hotels, restaurants and many other classes of private and public construction. One new example of signs are the air markers discussed in a recent issue of "finish Magazine." These are used to guide the aviator on his course and safely to his destination.

All of these tend to illustrate the versatility of "Porcelain Enamel on Steel" in the architectural field.

Science looks ahead

a billion dollars for research—some of the results you may expect

By Dr. Gerald Wendt • EDITORIAL DIRECTOR, SCIENCE ILLUSTRATED, NEW YORK, N. Y.

SCIENCE always looks ahead and has always been responsible for major changes in the American way of life. We live as we do today because of electricity and the gasoline engine, the telephone and radio, the airplane and a thousand other devices which once were laboratory curiosities. And so what is going on in the laboratories today will alter our lives in the future. I do not hesitate to say that we shall have more changes in the way we live in the next ten years than we have had in the last fifty—most of them because of the advances made by science in wartime.

A billion dollars for research

In war we always need more power and the only source of more power is more knowledge—and the only source of more knowledge is scientific research. So we have had a great upsurge of research during the past five years with more than 100,000 scientists at work last year spending nearly a billion dollars, not on construction of factories, but on research itself. It is no wonder that they gave us weapons for victory and also no wonder that peacetime applications of wartime science will have enormous consequences that most industry does not yet take into account.

First of all, there is the atomic bomb and its tremendous implication with respect to war. I shall not go into that here because the story has been often told and, also, because I am optimistic enough to think that we have seen the last of its use in warfare. I say this because first, we shall have no war for five years at least; second, because in five years every nation that wants atomic bombs can have all it wants; and, third, because there is one defense against these bombs—one and only one—that is the organization of a strong world government that will either

prevent future war or will prevent the use of atomic weapons. It is inconceivable to me that we can fail within five years to organize such a government. Far more important are the peacetime uses of atomic power, the discussion of which I postpone for the moment.

Ninety per cent of our future war planes will be "drones"

Other new weapons of war are equally important. Among them are—radar, which has extended the reach and the use of human eyes to a distance of 100 miles at least and through the blackest night and thickest fog; loran, which has ended the usefulness of the stars for mankind because it permits a navigator to tell where his ship or plane is at any point on the earth almost instantly by means of our present ability to measure time to a millionth of a second; the proximity fuse, which permits the firing of any shell or bomb, not on contact with its target, but at any desired distance from it, be it ten feet or 1,000 feet, by means of a radio signaling device in the nose of the shell which detects its approach to any object that reflects the radio waves; the pilotless plane, controlled entirely by radio waves from the ground or from a mother plane, which contains any number of weapons, cameras and instruments also controlled by radio—an item so important that General Arnold has predicted that in any future war 90% of the planes would be drones, flown without pilots; the jet engine which permits flight at 1,000 miles per hour or more and at incredible altitudes.

Devices for destruction have peacetime industrial uses

All of these wartime devices have peaceful and industrial uses. The jet engine will develop into the small,

very efficient, gas turbine engine which need not be used on planes and in which the engine itself is stationary but the exhaust blast of hot gases is directed against the turbine wall which absorbs the energy and gives high speed rotary motion for any industrial purpose. This seems very likely to become the most efficient as well as the lightest of engines and, therefore, has a future worth watching.

The principle of the proximity fuse is already being used in a device to aid the blind in walking by warning them of the approach of any solid object and, obviously, has unlimited possibilities in extending the human sense of touch for enormous distances.

Radar and loran will emerge as automatic control devices for many machines and the growth of radar has already greatly improved both the quality of television and its prospects of becoming a universal feature of American life.

As for atomic power—

This great power will certainly develop within the next ten years and may well cause an economic revolution. Three things need to be done by concentrated research. First of all, this large power must be brought under control so that it can be used when and where and at whatever rate we wish under constant control of an operator. What is needed is exactly what happened in the case of gasoline, which once was a useless hazard but became of supreme importance as soon as the internal combustion engine was perfected early in this century. It should take only three to five years to do the same thing for atomic power by bringing it under control in a suitable engine.

The second job for research is to make atomic fuel cheaper. At pres-

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A "three-in-one" plant synchronized for quantity production

detailed description of equipment and methods as used in one of the
industry's leading high production plants

By Claude Cleghon • GENERAL SUPERINTENDENT, PORCELAIN DIVISION, CLYDE
PORCELAIN STEEL CORPORATION, CLYDE, OHIO

Part II (Unit 3 — the tile line)



The third unit or "plant" at Clyde Porcelain Steel is our Veos tile line. This unit may be of interest because of the "straight line" nature of the production, the fact that it is a continuous operation from fabricated parts to the inspection and packaging belt, and that it is, insofar as we know, the only unit of its type in existence.

The tile is fabricated in our plant from sheet steel cut to size and fed to the presses in strips. A single operator can stamp as many as 3,000 tile per hour. As previously described (*see Part I — September, 1946, finish*), they then go through the pickle room in specially designed small baskets, with separators, which in turn are loaded into the production size pickle baskets. The pickled tile then goes to the production line in large tote boxes, the capacity of four or five of which will handle an entire day's production.

At present we are running ground coat on the night shift and cover coat in the day time. By the time this article is printed, a new ground coat furnace and dryer should be a part of our production line, so I will describe the unit as it will then operate.

Ground coat applied by electrostatic process

Tile is placed face up on a horizontal conveyor system consisting of piano wires revolving around motor-driven drums. The conveyor takes four rows of shaped tile, or six rows of "field" (flat) tile. They travel through an automatic electrostatic spray booth with guns mounted above and below for coating both the

face and the back side of the tile in the same operation. They are automatically transferred to a similar dryer conveyor consisting of 1/4" cable. The dryer is of the convection type with an outside gas-fired heater mounted on top, and has an auxiliary supply of heat from the furnace. Then comes a second transfer point, where the dried, ground-coated tile is transferred to an alloy chain conveyor feeding the ground coat furnace. The only manual operation here is a "lining up" of the tiles on the furnace conveyor.

As the tiles leave the furnace, they are conveyed under an air "cooler" and then transferred to another piano wire conveyor feeding the cover coat system. Cover coat application is accomplished in two automatic spray booths. The first automatic booth is set at a constant speed of 60 strokes a minute and applies the background or "base" cover coat. The second automatic booth has a variable speed drive and applies an overspray for the variegated finishes used. A space is provided between the two automatics for manual spraying of flanged work, such as for molding tile. As in the case of ground coat, cover coated ware is transferred to dryer cables and, after drying, to the alloy furnace chain for firing in the second or cover coat furnace.

At the exit end of the cover coat furnace there is another "cooler," and the ware is then automatically transferred from the cables to a belt conveyor which feeds the inspection and packaging line.

The complete conveyORIZED tile line is 250' from the point of loading the first conveyor to packaging of the finished tiles. Firing is done in gas fired radiant tube furnaces,

with tubes located in the bottom and sides.

Color control

Control of color is very important in this product. For this purpose, we have a set of master samples on a board adjoining the production line. At the start of each production run a trial run is made and checked against the master samples. The trial run must be OK'd by the production department before the line is ready to go, and production tile is checked constantly to be sure of a color match. Production of 5,148 tiles per hour is possible with this unit.

We use antimony type frits in this unit, and color matching is under the supervision of the mill room control department and, as indicated, subject to approval of production.

Veos tile is shipped in standard size cartons varying from one square foot to 20 square feet of tile in each. Foundation board is packed, six sheets per bundle, each containing 20 square feet or 120 square feet per bundle. Glue is packed 1 1/2 and three gallon size, with the smaller amount enough for installing 75 square feet of tile. Grout is packed 30 pounds per bag, enough for 200 square feet of tile.

There is coloring for grout in black, green, red, blue, yellow and orange in 1 1/2 pound packages, enough for 200 square feet of tile.

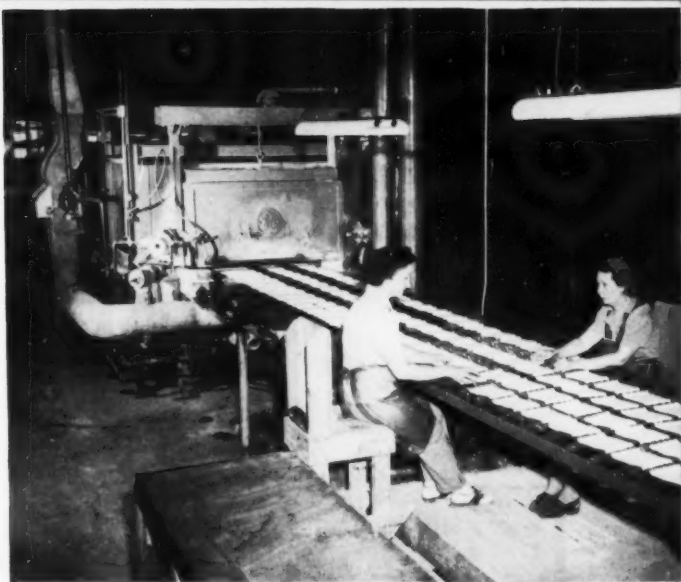
Average shipping weight for tile and all items necessary for installation is three pounds per square foot.

The plant furnishes everything necessary to make a perfect installation, including the cutting machine which is necessary for every job.

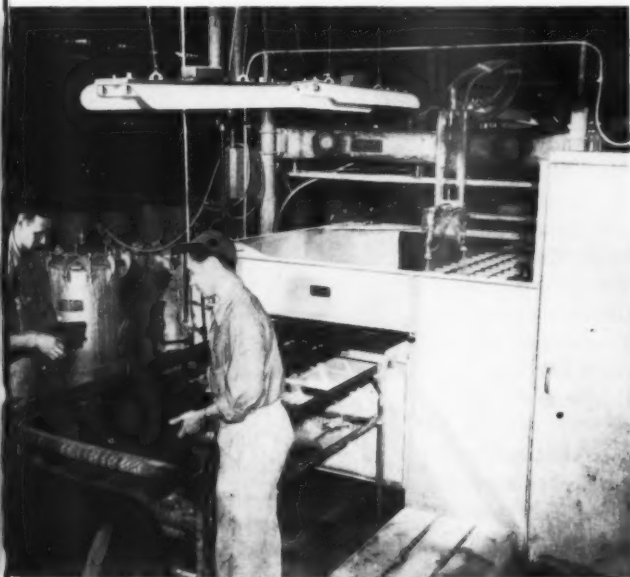
the tile line in pictures →



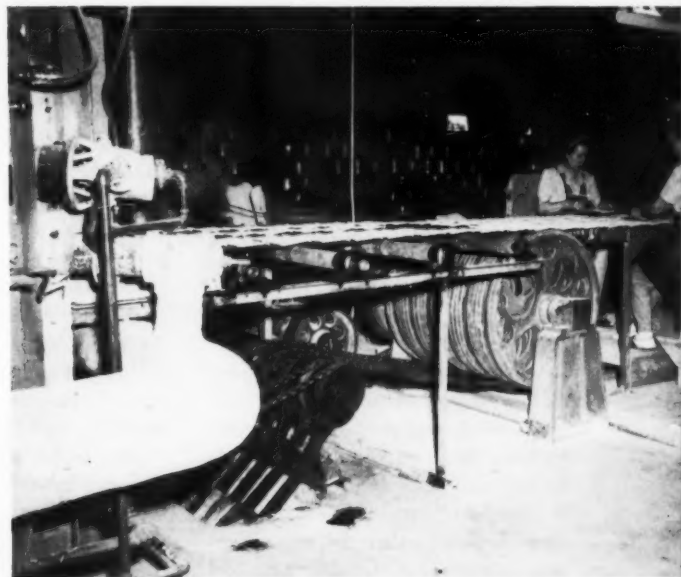
Method of loading tiles in production size pickling baskets.



Tiles are transferred manually from drier cable to furnace chain.



Loading ground coated flanged tiles ahead of finish coat system.

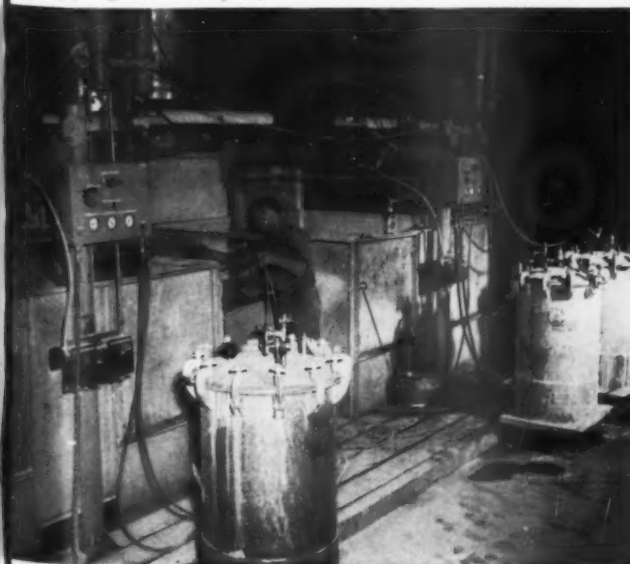


View of conveyor transfer drum — drier cable to furnace chain.

finishfotos

Praying flanges manually between automatic cover coat booths.

Inspection and packaging belt. At far end is the blower cooler.





A visit to Vitreous Steel Products Company



"Buzz" Felter at work in the porcelain enameling control laboratory.

It must be an order, judging from the smile of boss man, Harold Gray, snapped at his desk.

The Lieutenant Colonels, George Landis and Mel Combs, back on the job at Nappanee.



THIS summer we dropped in for a visit with the Vitreous Steel Products plant men, Nappanee, Indiana, where they are busy turning out table tops, lantern hoods, heater parts, and a variety of other products as fast as steel is made available for them.

We found Harold Gray, company vice president, in an attractive new office which was part of an essential building program for expanded laboratory and office facilities.

Included in the key organization men who have returned from the Service are George Landis and Mel

Combs. We had to kid Boss Gray a little on this score for being out-ranked. Harold was a Lieutenant in World War I, and both George and Mel returned from World War II as Lieutenant Colonels.

We saw "Buzz" Felter going about his duties as control man, and had an opportunity of watching production in this well-organized and smoothly run plant.

This is one of the porcelain enameling plants which continued to operate throughout the war. The company set up at Nappanee for high production of incendiary bombs and

other wartime products and at the same time kept the fabricating and enameling divisions in operation without interruption. For anyone familiar with plants such as this, where products are usually run in quantities for straight-line production, the furnace chain of Vitreous Steel Products would have been a peculiar sight at many times during the war because of the unusual products which were enameled. These included such items as: operating instruction plates for field ranges and ovens, tubes for stirrup pump extinguishers, hospital equipment, army stove parts, equipment for penicillin production, and lantern hoods.

They have a good spot at Nappanee to roll out the enameled ware during the day, but there's a golf course, lake and other interesting attractions for after-work activity.

This is the first of a series of short, short stories concerning enameling plants and enameleers.

Both pneumatic and electric tools are used for brushing on dryer conveyor.



The Washington round-up

By Wilfrid Redmond

Industries may apply for new price ceilings under the Barkley formula in the extended price control act (effective September 9). OPA has issued a detailed procedure on the compilation of data for such requests which must be presented through industry advisory committees. The new price formula provides for increases based upon 1940 profit margins plus current costs. The old standard—prior to June 30, 1946—provided for price relief on the basis of 1936-39 average earnings.

OPA has sixty days within which to act on industry requests for price adjustment under the new standard. Industries may also ask for decontrol of their products. OPA has announced procedures for requesting such action. If the price agency rejects a petition for price decontrol, an industry may appeal the decision to the Decontrol Board.

OPA will not initiate price adjustments under the new act. Industries must make the first move by asking for the appointment of an industry advisory committee, or if one already exists, for a meeting with OPA to request price relief.

New shortages foreseen

New shortages in basic materials and in manufactured goods are foreseen in the 60-day wait for OPA to act after an industry asks for an amended price ceiling. Metals are already in short supply because producers are holding back for new ceilings. OPA recently was forced to announce that no increase in the price ceiling for lead was contemplated. The report that such an action was under consideration was held by OPA to be largely responsible for the restricted flow of lead. There has been some discussion about placing restrictions on inventories of producers and refiners, but this action has not been attempted because of the difficulties foreseen in enforcing such inventory control. OPA, however, has the power to control

inventories, and may attempt such a program if the basic metals do not start to move in the quantity regarded as normal.

Increases in the price ceilings for copper, lead, and zinc will probably be requested under the Barkley formula. The lead industry has already asked for the appointment of an industry advisory committee, the copper industry has one, and the zinc industry may have such a committee appointed by OPA although it has not been requested. The zinc industry is divided on the question of a new price ceiling, with some producers indifferent to any increase.

Some grades of zinc are now in short supply and are expected to reach a more critical position this fall when heavy galvanizing demands reach their peak.

Lead is far short of requirements. The Automobile Manufacturers' Association recently pointed out that the demand is for 80,000 tons a month and production is only 25,000 tons a month. The auto makers petitioned John R. Steelman, director of the OWMR, to direct OPA to increase the price ceiling from 8¼ cents a pound to 9½ cents in order to get out production.

Current chemical supply position

The supply position of some of the chemicals used by the ceramic industry was recently reported by CPA to be the following:

Antimony oxide—Meeting screened demands. Future supplies depend on arrival of ore.

Barium Carbonate—tight.
Borax—short supply.
Boric Acid—short supply.
Clays—adequate.
Cobalt Oxide—presumed to be adequate.
Cryolite—adequate.
Feldspar—adequate.
Fluorspar—adequate.
Lead Silicate—short supply.
Litharge—short supply.
Manganese Oxide—adequate.
Soda Ash—short supply.
Sodium Antimonate—meeting screened demands.
Sodium Nitrate—short supply.
Sodium Silico Fluoride—adequate.
Titanium Oxide—short supply.
Zinc Oxide—medium short supply.
Zircon—probably adequate.

Hydrochloric Acid—adequate.
Sulphuric Acid—adequate.
Aluminum Hydrate—adequate.
Magnesium Carbonate—adequate.
Sodium Silicate—tight.
Whiting—adequate.
Tin Oxide—short supply.
Red Lead—short supply.

The Soda Ash Industry Advisory Committee recently objected to a suggestion for priority ratings as a means of getting equitable distribution of the supply. Because of the current short supply, members of the committee stated, any considerable tonnage shipped new consumers under priority ratings would have to be diverted from shipments to the industry's established customers. The committee recommended continuance of the voluntary rationing program.

The Office of International Trade reported to the committee that 45,000 tons of soda ash were exported from the U.S. during the first six months of 1946. Only a small fraction of this total was exported by producers, suggesting the possibility that some consumer-purchasers may be diverting some of their supplies to export. Members of the committee suggested that all soda ash exports be placed under license by OIT.

Price adjustments for distributors

OPA recently adjusted prices of retailers and wholesalers in accordance with the provisions of the Wherry formula in the new price control act which restores markups of these distributors which were in effect on or before March 31, 1946. The action effected the following changes in consumer durable goods retail ceilings: household mechanical refrigerators, a 6 per cent increase; gas kitchen stoves, 5 per cent; electric kitchen stoves, 9 per cent; and washing machines, 7 per cent.

Enamel kitchenware

Manufacturers of enamel kitchenware have been given to October 1, 1946, to re-ticket their products with new ceilings. The previous deadline on re-ticketing was September 1. The extension was granted when most manufacturers indicated they would be unable to comply with the previous requirements that all shipments made to distributors after September 1 be tagged with new retail ceilings.

to Page 32 →

PEOPLE YOU KNOW

TOM M. SOURBECK (right), genial manager of the Lorain Division of American Stove Company, Lorain, Ohio, entered the manufacturing business at the age of 19. He came up through the ranks as a bookkeeper, accountant and purchasing agent, and in 1915 was appointed sales manager of the then New Process Division of American Stove Company. He was put in charge of the Lorain Division in 1928. His residence is a large lakeside home surrounded by flower gardens on the Lake Road a few miles east of Lorain. He takes his civic duties seriously and is active in the Chamber of Commerce and Rotary Club.

HAROLD G. WOLFRAM (below) is a native of Des Plaines, Ill., where he was nicknamed "Ping" in high school baseball. His first enameling job was with Royal Enameled Mfg. Co. (later Benjamin Electric Mfg. Co.). "Ping" has a degree in ceramic engineering from the U. of I., and was for three years chief of the Enameled Metals Section, National Bureau of Standards, resigning in 1926 to become director of research for Pemco Corp. He is now V.P. and works manager. He is a founder and past president of the Inst. of Cer. Engrs., and a member, fellow, and past chairman and sec'y of the A.C.S. Enamel Div.



finishfotos



ROBERT LONG (right) is president of American Porcelain Enamel Co., Muskegon, Mich. Following schooling in Beaver Dam, Wis., "Bob" started with the Monarch Malleable Iron Range Co., of that city, in 1917. His experience includes work with a long list of companies associated with porcelain enameling: Western Electric Co.; Cribben & Sexton Co.; Wolverine Porcelain Enamel Co.; Superior Enamel Products Co.; Binks Mfg. Co.; and Ingram-Richardson Mfg. Co. of Ind., in capacities ranging from enamel superintendent to plant manager. He organized his own company for the manufacture of porcelain enamel frit in 1937.



OR
SHOULD
KNOW

Strictly Candid



finishfotos

DR. J. J. CANFIELD (left) is supervising metallurgist of the research division, American Rolling Mill Co., Middletown, Ohio. He attended Oklahoma A & M, the University of Illinois, and later Iowa State College. After receiving his M.S. degree, he taught chemistry and earned his Ph.D. He belongs to three honorary societies, and is a fellow in the American Ceramic Society. He served three years on the Enamel Division editorial committee of A.C.S., has been program chairman, and is a member of the Products Standards Committee of P.E.I. He is the author of a number of papers on fabricating and enameling subjects.



AROL HALL (above) started with Globe American Corp., Kokomo, Ind., in 1926. A month later Globe completed its porcelain enameling department, and Arol started his career in ceramics as a sprayer's helper. After getting practical experience in various operations in enameling, he was promoted to assistant foreman and, in 1930, to foreman. During the war when there was no enameling activity, Arol served as personnel manager, and then was charged with the responsibility of laying out, purchasing and installing a new continuous furnace porcelain enameling department for gas ranges. He is a consistent "low 80's" golfer.



FRED A. PETERSEN (left) is special research associate professor assigned to the Enameled Utensil Manufacturers Council project at the University of Illinois. He has a B.S. degree from the U. of I., and an M.S. degree from O.S.U. His practical plant experience includes work at Frigidaire, Rundle Mfg. Co., Ingram-Richardson, and Florence Stove, Gardner. Constantly active in enameling industry organization work, he has been on committees of the A.C.S. Enamel Division, P.E.I., Chicago District Enamelers Club and the E.U.M.C. He is author and co-author of a long list of papers and articles on enameling subjects.

→ from Page 29

Porcelain enameled

product shipments

The value of shipments of porcelain enameled products fell off during July, reflecting strikes and resultant materials shortages. Shipments in July amounted to \$5.5 million, 3 per cent less than the \$5.7 million shipped in June. Shipments of cooking, household and hospital utensils accounted for almost \$2.2 million of the total for July.

The Bureau of the Census reported that the decrease in shipments during July was largely due to a drop of almost 50 per cent in shipments of table tops.

Shipments of porcelain enameled products during June and July were as follows:

	July	June
Signs	\$ 296,508	\$ 313,154
Stove parts	505,207	509,036
Refrigerator parts (Household and commercial)	373,483	388,838
Reflectors (Including fluorescent)	417,421	350,146
Cooking, household and hospital utensils ..	2,174,381	2,093,609
Table tops (kitchen cabinets, dinette sets, breakfast sets)	276,472	521,918
Store fronts and other architectural porcelain parts (exterior and interior)	124,433	86,815
Washing machine Parts	530,724	545,189
All other products ...	841,084	922,038

Slow increase in production

for housing program

Manufacturers forecast to CPA a relatively slow rate of increase in production in some of the industries important in the housing program. Among these are sanitary ware and plumbing supplies. However, some industries producing for the home building program are booming along at a high rate. These include stoves and ranges. A greater rise in production is expected to come in the durable goods industries.

Latest move of Housing Expediter Wilson Wyatt to increase production of products important to the housing program is a plan to allow a subsidy of \$8 per ton in the production of pig iron. This premium program is designed to bring into production closed down furnaces and new furnaces, which will release other furnaces that normally supply other industries.

HH ratings explained

Gas and electric ranges, heating stoves, and kitchen cabinets have been added to the list of items for which retailers must honor HH ratings. The seller is required to honor HH ratings up to 75 per cent of his sales monthly.

The ruling which is contained in an amendment to PR-33, has caused considerable confusion in the distribution trade in that sellers have not been able to figure out how the set-aside would operate. John D. Small, CPA administrator, recently cleared up the regulation with the explanation that if the retailer does not receive any HH ratings during the month, he may sell his stock without restriction. He is not required to hold any inventory in anticipation of

rated orders. The order protects the normal sales pattern of the dealer in that he is not obligated to honor ratings which would take his entire stock. A retail store which did not customarily sell to a builder in the past would not be required to honor a large order for electric ranges, but a store which did sell to builders in large quantities in the past as a regular practice would be required to continue to supply that customer on HH ratings up to 75 per cent of his stock. Retailers may not pass on the HH orders to suppliers.

OPA has announced that the recent 3.5 per cent manufacturers' ceiling price increase granted on household mechanical refrigerators will also be applied to refrigerator repair and replacement parts, effective Sept. 17.



"WE DON'T MIND THE WETNESS, IT'S JUST THE STEADY DRIP, DRIP THAT MAKES IT MONOTONOUS"



SUGGESTION BOX

Sodium nitrite¹ vs. - potassium carbonate

a suggestion by RALPH L. FORAKER, Pemco Corporation

THE use of sodium nitrite and potassium carbonate as electrolytes in zircon enamels has been common practice for the past several years. Either one or both of these materials are normally added as a part of the mill addition. In the majority of cases, sodium nitrite is also added to the milled enamel prior to spraying, the purpose being to prevent tearing and to increase the set until the desired pickup is obtained.

Comparison tests

It is known, of course, that sodium nitrite reduces luster and opacity, while potassium carbonate improves both, in the amounts ordinarily used. For this reason, test runs were made in enameling plants for comparative purposes. Checks were made using zircon enamel and

addition, and to add sodium nitrite to the milled enamel in preparing it for the spray line.

In preparing the test enamel for the spray line, we found that where it had been common practice to use $3\frac{1}{2}$ to 4 oz. of sodium nitrite (to 100 lb. of frit) to get the standard pickup, it was necessary to use but $1\frac{1}{2}$ to 2 oz. of potassium carbonate.

In this plant an automatic spray machine was used for applying the material, and it was found that to maintain the standard weight of application it was necessary to use but 20 lb. of air pressure on the pressure tank, where in the past it had been necessary to use 28 lb. when using the enamel in which both potassium carbonate and sodium nitrite had been included. This change also resulted in a smoother spray. Tearing was not encountered with either en-

tendency to aggravate blistering as does sodium nitrite.

Production aid

Many plants attempting high production with continuous spray equipment have found difficulty in feeding sufficient cover coat enamel through the spray guns to get the desired one-coat job at high conveyor speeds. As a result, it sometimes has been necessary to reduce conveyor speeds to get proper weight of application, and in such instances production is retarded.

By the use of the mill addition as suggested, it probably will be found that the enamel will feed through the guns in sufficient volume to get a good one-coat application without reducing the conveyor speed.

The procedure suggested may not work in all plants, but if you are having trouble with atomization or trouble forcing enough enamel through the spray guns to meet production requirements, I feel this procedure would be well worth trying.

NEW LITERATURE

New cleaning handbook

"Production and Maintenance Cleaning" is the title of a new handbook giving information on methods and compounds for use in various types of production line cleaning as well as maintenance cleaning. The booklet is pocket size.

Write on company letterhead to Phillips Chemical Company, 3400-26 Touhy Avenue, Chicago 45, Illinois.

Booklet on basic water-softening methods

Basic types of ion-exchanging water softeners for industrial, institutional and municipal use are explained in a booklet issued by The Permutit Company, 330 West 42nd Street, New York 18, New York. Copies of the booklet can be had upon written request to the company.

Bulletin on air receivers

Complete size and pressure data on air receivers for air compressor ser-

What is your suggestion?

This is the first of a series of suggestions from practical enamellers to be carried in *Finish* for the benefit of all enamellers.

This new department is the result of numerous requests from *finish* readers. It is for the purpose of exchanging information between enamel plant operators, or any one in the industry whose work makes it possible to offer constructive suggestions that have proved their worth in enamel plant operation. The department will appear in subsequent issues whenever material is available that may improve industry-wide plant operation and is, therefore, acceptable for the department.

Every shop man should have some suggestion for this department that has saved time or money in his plant. *Finish* will pay a minimum of \$10.00 for each idea printed in The Suggestion Box. (Additional funds may be allotted at the discretion of the editor for drawings or photographs furnished.) Send your suggestion now.

The publisher is not responsible for the return of material submitted.
All material accepted for printing becomes the property of *finish*.

eliminating the sodium nitrite, both before and after milling.

In a typical plant test, 3 oz. of potassium carbonate for 100 lb. of frit were used in the mill and enough tetra sodium pyrophosphate to reduce the set to a point where the milled enamel was easily removed from the mill for screening into storage tanks. The previous standard procedure in this plant was to use potassium carbonate alone in the mill

amel, so no conclusion could be reached in this respect.

Other benefits

One of the benefits of using potassium carbonate is that it tends to correct poppers. It may not be a cure-all in this respect, but it has been proved definitely beneficial in many instances.

It also has been found that potassium carbonate does not have the

vice are contained in a new bulletin published by Scaife Company, Oakmont, Pa. Available sizes, according to the manufacturer, have been developed through extensive experience on the part of design and application engineers.

Write for Air Receiver Bulletin No. 320.

Service report on new solvent

A new self-emulsifying, water-mixable solvent, called Composition No. 98, that removes light shop dirt and non-pigmented stamping compounds from steel and aluminum work, has been made available for use primarily in pressure-spray washing machines.

A free Service Report giving details may be secured by writing on company letterhead to Oakite Products, Inc., 57 Thames Street, New York 6, N.Y.

Pyrometer supply guide

The Brown Instrument Company has issued a Buyers' Guide on standard pyrometer supplies. This booklet presents clear and concise information to purchasing agents and instrument men on how to order thermocouples, protecting tubes, thermocouple wire, lead wire, insulators, etc.

Address The Brown Instrument Company, Accessories and Supplies Division, Philadelphia 44, Pa.

Ferro quarterly price list

Recently Ferro Enamel Corporation, Cleveland, Ohio, inaugurated a quarterly price-list, giving prices on supplies for porcelain enameling. Upon request, copies will be mailed regularly to those interested.

Pickle tank testing

"Quick, Accurate Pickling Tank Tests" is the title of a folder recently issued. The contents describe an "on the spot" check available for determining strength of pickling tanks and iron content of tanks. The spot check is in the form of Pickle Pills.

Copies of the folder are available without obligation from Ferro Enamel Corporation, 4150 E. 56th Street, Cleveland, Ohio.

New supplies and equipment

New core-plate enamel tester



A new core-plate enamel tester designed for measuring the insulating value of enamel coatings on sheet steel has been announced by the General Electric Company. Consisting of a test head, a hydraulic press and a control unit, the tester provides a standard for measuring the insulating quality of enamels, and thus facilitates selection of the best enamel for any insulating application.

Contact General Electric Company, Apparatus Department, Schenectady, N.Y.

New horizontal grinders

The Master Pneumatic Tool Company, Inc., 2100 Keith Building, Cleveland, Ohio, has recently put on the market a new line of "Master Power" horizontal grinders for the metal working trades and all metal finishing plants. Ask for descriptive sheet MPT-604.

Bus duct for industrial plants

To aid in the selection and application of a bus duct system to provide flexible, accessible power in industrial plants, a new data book is announced. Contact Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa., for booklet B-3714.

Elapsed time indicator

Marion Electrical Instrument Company, of Manchester, New Hampshire, announces production of the Model HM3 Elapsed Time Indicator

for operation on 115 volts, 60 cycles, indicating elapsed time from zero to 9,999.9 hours. The unit conforms with standard JAN I-6 mounting dimensions.

Protection for burning tools

The O. Hommel Company, of Pittsburgh, has announced the development of a new semi-glazed, "porcelain-like" finish — "porcelanite" — for protecting cold rolled and cast iron burning racks, burning tools, iron and glass furnace interiors, saggers, lehrs, decorating kilns and ladle-linings.

This semi-glaze finish is designed to prevent burning racks and tools of cast iron and steel from scaling. It is also reported that stainless steel tools are more easily cleaned after being coated with porcelanite.

For further information, contact The O. Hommel Co., 209-13 Fourth Ave., Pittsburgh, Pa.

Hand tools for feeding presses

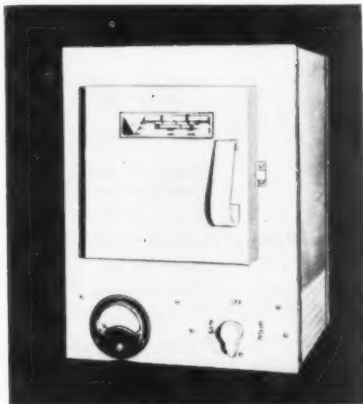


Reynolds Metals Company, Louisville, Ky., has found that aluminum bar stock of $\frac{3}{8}$ -inch diameter is suitable for fabricating into pliers, tongs and special hand tools for use in feeding parts to punch presses. The $\frac{3}{8}$ -inch round 2S aluminum bar stock is soft and easily fabricated by one of the plant mechanics into any special shape of hand tool that may be needed.

The announcement states that if the points become caught between the

dies of the press, the metal is soft enough to avoid breaking the dies.

New laboratory furnace



A new heat treating furnace in the low cost field, available to laboratories and small workshops, utilizing temperatures up to and including 1350° F., has just made its appearance on the market. The new furnace is a product of the Pereny Equipment Co., 342 N. Pearl St., Columbus, Ohio, manufacturers of a complete line of furnaces and kilns. Refer to Model 220-W.

New sealing compound

A new organic product has been developed as a general-purpose thread and gasket sealing compound. It is said to produce a high efficiency seal which is proof against air, water, steam, gas, gasoline, oil, hydraulic fluids and aromatics.

Contact Parker Appliance Company, Cleveland, Ohio.

Electronic counter



A new electronic counter, with specific application in industries in which counting control plays an important part, has been announced by

Potter Instrument Company.

A convenient control also is provided for rolling mills, where the counting of predetermined numbers of rapidly moving sheet stock is accomplished, after which a solenoid is energized to stop or divert the flow of materials.

For additional information, write direct to Potter Instrument Company, 136-56 Roosevelt Avenue, Flushing, New York.

Automatic clutch

Hardinge Bulletin 45 describes the BLM "Auto-Centri" automatic clutch on which manufacturing rights have been obtained from the Automatic Clutch Corporation of Canada.

The clutch is available in sizes from fractional horsepower to 5,000 horsepower for any type of power drive. When installed with an electric motor drive, a standard squirrel cage motor with across-the-line starting equipment can be used.

Contact the Hardinge Company, Inc., York, Penn.

New blast cleaning device

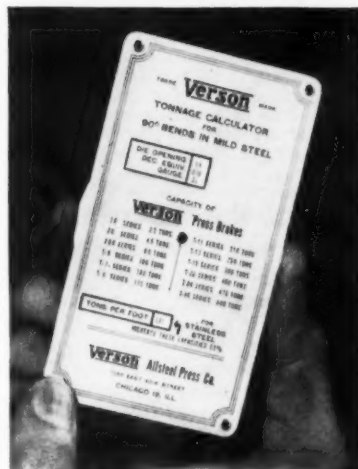


The Vacu-Blaster, said to be an entirely new type of blast-cleaning device for the cleaning of metal, is now in production. This new unit features a vacuum return system said to permit no abrasives or other particles to escape into the open. It operates at any location in similar fashion to a household vacuum cleaner, and requires no masks, goggles or protective clothing.

Spent abrasive materials are reclaimed and re-used as long as they remain effective.

Contact Vacu-Blast Co., Inc., 1054 Broadway, Burlingame, California.

Bending and punching-calculator free to metal working plants



Designed to aid in solving forming and punching problems for the sheet metal industry, the new Verson Bending and Punching Calculator is now available without charge to all shop supervisors, engineers, and executives in metal-working plants. By the simple turn of a wheel, this handy device gives the die opening and press capacity required for making 90° bends in mild steel and stainless steel of all commonly used gauges. For punching operations, the calculator indicates the tons per hole required to punch holes of eight different sizes in mild steel plate of a wide variety of gauges.

The calculator itself is of sturdy celluloid construction and should prove a valuable aid to all persons concerned with the bending and punching of steel. It may be obtained free of charge by writing Verson All-steel Press Company, 1355 E. 93rd St., Chicago 19, Illinois, with reference to this announcement in *finish*.

Heat all acid fruits and foods in a porcelain enameled utensil to insure their keeping a delicate flavor, and also to prevent any loss of color. Non-absorbent porcelain enameled kitchen ware assures complete freedom from any previous food tastes seeping into the acid fruits.

From the Editor's mail . . .

The E. F. Hauserman Company, Cleveland, Ohio
(Movable steel partitions, wainscot and acoustic steel ceilings)

"Several of us in sales planning, production and supervising of our finish operations find the articles in your magazine interesting and pertinent to our work. We occasionally have to furnish porcelain enameled panels in connection with our regularly finished panels (baked-on synthetic enamel) for partition installations. Your magazine keeps us abreast of the architectural uses of porcelain enamel, and that is the standpoint from which it is most read in our offices. It seems that there is a gradually narrowing gap between vitreous finishes and baked synthetic finishes, and we are watching your columns with interest in regard to this 'middle ground.'"

Robert S. Cook, Promotions Manager

General Electric Company, Erie, Pa.
(Refrigerators)

"I am enjoying Finish very much and so does my wife. We would never want to miss it."

August W. Meyer, Asst. General Foreman

O. Hommel Company, Pittsburgh, Pa.
(Ceramic material suppliers)

"Everywhere I go I hear favorable comments. Need I say more? Best wishes."

Herman L. Cook, Sales and Service

Porcelain Enamel Specialties Company, Baltimore, Md.

(Architectural porcelain enamel)

"Finish unquestionably is contributing to the general advancement of our industry. Its spirit and drive, coupled with its always appropriate articles and fine illustrations, is doing much more for the advancement of Porcelain Enamel than any medium has ever done before."

Howard Michel, Owner

Department of Ceramic Engineering, U. of I., Urbana, Illinois

(Research work)

"I have enjoyed your very fine magazine since its 'government-stalled' start to the present time, and hope I will continue to receive it in the future. You certainly deserve the congratulations and thanks of the entire enameling industry for a tough job well done."

F. A. Petersen, Special Research Assoc. Professor

Smith St. John Mfg. Co., Kansas City, Mo.
(Hotel and restaurant equipment)

"I have missed many issues of your magazine during my service with the Navy, but am reading many back issues. Your magazine is very interesting and helpful to me."

Monte W. Allen, Draftsman

Lawrence H. Selz Organization, Chicago, Illinois
(Publicity council for E.U.M.C.)

"We receive sixty or so trade journals a month in this office relative to various of our accounts, and I can truthfully say that Finish is by far the most attractive and lively in layout and format."

Edward Sonnenschein, Account Executive

Seapacel Porcelain Metals, Inc., Long Island City, N.Y.

(Jobbing — signs — architectural parts)

"Splendid publication. Best in the field."

M. Jesse Salton, President

Roberts & Mander Corp., Hatboro, Pa.
(Ranges)

"Finish is quite readable, from all standpoints. Suggestion: Continue to bear down editorially on education of the public on porcelain enamel."

Lester S. Thomas, Chief Inspector

Clyde Porcelain Steel Corp., Clyde, Ohio
(Washing machines — jobbing plant)

"You are to be congratulated for putting out the best paper in the field."

E. M. Higley, Assistant Superintendent

University of Illinois, Dept. of Ceramic Engineering, Urbana, Illinois

(Research)

"Finish is to be complimented for the complete coverage it has given the porcelain enameling industry and for the high standards set by the publication."

W. J. Plankenhorn, Special Research Associate

Manson Company, Philadelphia, Pa.

(Cast iron (porcelain enameled) table pedestals and counter stools)

"Please mail future issues to my business office. I find your Finish most interesting and educational."

Newton Burrison, Partner and Sales Manager

Lawndale Enameling Company, Chicago, Illinois
(Jobbing plant)

"Finish is the best enameling magazine out. Thanks for keeping me on your mailing list."

Leonard Lodestro

Ohmite Manufacturing Co., Chicago, Illinois
(Vitreous enameled resistors and rheostats)

"I feel that 'Finish' is doing a fine job of helping to bring the use of porcelain enamel to the forefront."

Harold Miller, Ceramic Engineer

Donnelly Electric & Mfg. Co., Boston, Mass.
(Sign advertising)

"Your sign articles have been most interesting and informative."

Nicholas Cannistraro, Sales

Vitreous Steel Products Co., Cleveland, Ohio
(Jobbing)

"Your publication is outstanding! It's obvious that you put a lot of time, thought and effort in each issue. You seem to cover the porcelain field, organize and group your material intelligently — and carry appealing ads."

William H. Lowry,
Sales, Production, Financial

Detroit-Michigan Stove Company, Detroit, Michigan

(Stoves)

"An excellent publication — getting better!"

V. R. Luster, Ceramist

General Electric Company, Erie, Pa.
(Refrigerators)

"I look forward to receiving this magazine every month as it gives me new ideas about enameling and keeps me informed about other enameling plants."

Frank J. Sonzala,
Foreman Ground Coat and Pickle Operations

Hughes Aircraft Company, Culver City, California
(Aircraft)

"We have found the information in 'Finish' very interesting."

H. A. Sullwold, Plant Staff Engineer.

The Tappan Stove Company, Mansfield, Ohio
(Ranges)

"Your publication, although relatively new, is winning more and more friends each day by the exclusive stories carried and also by the editorial content and comments."

"We are glad to receive this publication for its merits."

George S. Condes,
Director of Public Relations

National Bureau of Standards, Washington, D. C.
(Research)

"I am heartily in favor of more cooperation between the Enamellers Clubs, the P.E.I. and the A.C.S."

(See "The Finish Line," June, 46)

Joseph C. Richmond, Ceramic Engineer

The Warren Company, Atlanta, Ga.
(Commercial refrigerators)

"One of the best publications in the porcelain enamel trade. Always look forward to getting new issues."

E. B. Flowers, Ceramic Engineer, Metallurgist

Servel, Inc., Evansville, Indiana
(Refrigeration)

"This magazine is used in our Engineering Library."

Ann Mroz, Engineering Librarian

A. O. Smith Corporation, Milwaukee, Wis.
(Water heaters, beer tanks)

"An excellent magazine. Keep it up!"

Wayne A. Deringer,
Asst. Director of Ceramic Research

Boeing Airplane Company, Wichita, Kansas
(Aircraft)

"The utilization of porcelain enamel in aircraft is quite limited. However, it is desirable to keep abreast of all new developments in finishes."

W. Ray Holleman, Chief Librarian

National Bureau of Standards, Washington, D.C.
(Research)

"An excellent publication."

D. G. Moore, Ceramic Technologist

Day-Brite Lighting, Inc., St. Louis, Missouri
(Lighting equipment, commercial and industrial)

"We enjoy reading your magazine and noting the ads. It is a well made up and valuable source."

D. M. Baker,
Purchasing Agent and Traffic Manager

American Stove Company, Lorain, Ohio
(Stoves)

"I find your magazine, Finish, very interesting and educational."

Luther W. Hale, Foreman, Porcelain Dept.

Frigidaire Division, General Motors Corp., Dayton, Ohio

(Refrigerators, electric ranges)

"Thanks for subscription. Finish is doing fine. Keep it up."

W. H. Pfeiffer,
Ceramic Engineer, Engrg. Dept.

Engineers and Electricians, the Industrial Manufacturers Society and the Society for the Advancement of Manufacturing.

NEWS

V. A. Burlew, Portland, Editorial Company, announces the addition of Charles H. Scott to the organization. Mr. Scott (Scotty) to industrial

under the 1939 filter and NBE Circular 1939. And in a permanent, hinged-to

Hickitt's standard for blind bottling. In the general review new "Marchall" factory, Pennsylvania, Florida St. all as a complete unit can 1000 long by 1100 wide. According to design the new bottling equipment with an

AGA industrial and commercial program

The program committee of the Industrial and Commercial Gas Section, American Gas Association, under the chairmanship of Frank H. Trembly, Jr., has prepared a program with many interesting features for this Section's part in the annual meeting of the Association to be held at Atlantic City, N.J., during the week of October 7.

Of special interest to industrial and commercial gas men, and executives, will be this Section's program on Tuesday and Thursday afternoons, October 8 and 10. Starting with a luncheon on Tuesday, October 8, in the Rose Room of the Hotel Traymore, the guests will hear an address, "Future Industrial Production."

Included in the program is a panel discussion on "New Developments in Industrial Furnaces and Ovens," presented by representatives of five furnace and oven manufacturers.

New American Central general manager

Carl H. Kindl, vice president in charge of manufacturing of The Aviation Corporation, has been named general manager of American Central Manufacturing Corporation. This was announced recently by Irving B. Babcock, president of The Aviation Corporation and chairman of the board of American Central Manufacturing Corporation.

Saunders P. Jones has resigned as president of American Central to become president of Mary Chess, Inc.,

in which he has acquired controlling interest. He will continue to serve as a director of American Central.

Hamilton director of purchases at Seeger-Sunbeam Corp.



George W. Hamilton has been appointed director of purchases of the Seeger-Sunbeam Corporation, St. Paul, Minn., according to J. S. Holl, general manager of the corporation.

Mr. Hamilton takes over his duties in the purchasing department after being with the corporation twenty-one years. He was formerly traffic and service manager.

E. J. Vollhaber remains as purchasing agent, and K. H. Fishleigh is acting traffic manager, Mr. Holl said.

The Seeger-Sunbeam Corporation was formerly known as the Seeger Refrigerator Company, and manufactures household and commercial refrigerators under contract, and merchandises its own line of commercial refrigerators.

Joe Taylor to Anderson Stove as works manager

John T. Mascuch, president of Breeze Corporations, Inc., Newark, New Jersey, has announced the appointment of Joseph D. Taylor, Jr., as works manager for Anderson Stove Company, Breeze subsidiary, at Anderson, Indiana.

Taylor is well known to many enamellers and stove men through his former 20-year connection with Standard Gas Equipment Corp., Baltimore, where he was superintendent of the heavy duty division.

Breeze reports having completed a streamlining project at their Indiana plant where "sealed-heat" stoves are produced, and at Co-Subsidiary Foundry Service, Inc., Anderson. The parent company acquired both of these companies last March.

Stuckey to Moore Corporation

Warren Stuckey has been appointed chief engineer of the Moore Corporation, Joliet, Illinois.

Mr. Stuckey spent ten years as chief testing engineer of the Florence Stove Company, Kankakee, Ill., including service as chief research engineer and, during the war, was chief inspector and metallurgist in the Florence armor plate program. At the end of the armor plate production, he went to the National Enameling and Stamping Company, Milwaukee, as mechanical and combustion engineer.

Cribben & Sexton advances Jalass

Harold E. Jalass has been appointed assistant general sales manager of Cribben and Sexton Company, manufacturers of Universal gas ranges, it was announced recently by John E. Bogan, vice president in charge of sales.

For the past fifteen years Jalass has been district manager for the company's gas ranges in Metropolitan Chicago area. His specialty is point-of-sale demonstrations before groups of 25 to 200 persons.

W. Scott Hill has been appointed to the recently created post of manager of engineering of the Locke

Insulator Corporation, Baltimore, Md. Mr. Hill was formerly an assistant district engineer of the General Electric company.

The annual company picnic of Clyde Porcelain Steel Corporation was held at Meadowbrook Park, Bascom, Ohio, in August. Twelve hundred were in attendance to enjoy the rides, concessions and refreshments provided free. At a morning assembly R. R. Trubey, Assistant to the President Andy Grierson, and Treasurer Ira G. Boyer were the speakers.

**Robert Myers to assist
Robert Ritchey at U. S. Steel**



The appointment of Robert C. Myers as assistant manager, market development division of U. S. Steel's Carnegie-Illinois Steel Corporation sales department, has been announced by Robert J. Ritchey, division manager.

Mr. Myers is a graduate of the University of Pittsburgh and was an assistant merchandise manager at Kaufman's Department Store in Pittsburgh, before joining the sales promotion bureau of Carnegie-Illinois in 1939. During the war, he was in the Navy on active duty for nearly five years. He served on the staff of Vice Admiral Richard E. Connelly aboard the flagship USS Appalachian.

The Pennsylvania Salt Manufacturing Company announced recently net profits of \$1,460,335.23 for the fiscal year ending June 30, 1946,

after deduction of Federal taxes. The profits are equivalent to \$1.95 per share on 750,000 shares of \$10 par stock outstanding, as compared with earnings for the fiscal year ending June 30, 1945, of \$1,441,022.17 or \$1.92 per share.

New technical bulletins issued by PEI product standards committee

Information concerning two new technical bulletins has recently been released by the Porcelain Enamel Institute.

Technical Bulletin T-12 — *Preparation of Metal for Porcelain Enameling* — is a new addition to the list of P.E.I. bulletins. It is the most authoritative exposition of the principles of metal cleaning that has yet been offered to porcelain enamellers. Topics covered include drawing compounds, pre-cleaning, alkaline cleaning, acid baths, nickel-dip, etc. Methods of controlling the pickling solutions are outlined in detail, and the appendix includes instructions for the preparation of standard solutions and reagents.

Bulletin T-12 was originally prepared and issued by the Joint Committee of Frit and Porcelain Enameling Sheet Manufacturers, which has authorized its publication by the Institute.

Technical Bulletin T-3 — *Ball Mill Wet Grinding of Porcelain Enamels* — is a revision of a previous edition. The Product Standards Committee has revised the text to bring it in line with modern practice, and a new section, entitled Tentative Screen Test for Wet Milled Porcelain Enamel, has been added.

Copies of the bulletins may be had by sending a request to the Porcelain Enamel Institute, 1010 Vermont Ave., N.W., Washington 5, D.C.

Locke Insulator expands field sales offices

Locke Insulator Corporation, Baltimore, Md., announces the following additions to its field sales offices: L. M. Backus, Jr., has been added to the staff of the Pittsburgh District, with headquarters at Cincinnati, Ohio. Hubert M. Carmichael has

been added to the Atlanta District, with headquarters at Jackson, Miss. John W. Mangold has been appointed as sales engineer on the Baltimore District. His headquarters will be at Baltimore. P. H. Reynolds has been added to the staff at the Atlanta District office. R. W. Sebastian has been appointed as sales engineer in the Chicago District, with his office in Chicago. A. H. Dillman has been appointed as district manager of the Philadelphia District, and will have his headquarters in Philadelphia.

Walter Punsky to new position



Recently announced was the appointment of Walter Punsky as quality manager for Clyde Porcelain Steel Corp., Clyde, Ohio, and its affiliated companies, Artkraft Mfg. Corp., Lima, Ohio, and Baltimore Porcelain Steel Corp., Baltimore, Md.

Mr. Punsky, who has had wide experience in the manufacturing field, which he first entered in 1908, joined Clyde in 1941, and in 1943 became works manager, a post he held until early this year when his health forced him to take a prolonged vacation. Upon his return he was appointed to his present position in which he will work with the managements of the three plants as a liaison man between the manufacturers and customers, maintaining a close contact and checking to see that quality and standards are maintained.

Dorothy Louise is the name of the

new daughter in the L. K. (Kern) Sosey home. She was born August 14. The proud father is superintendent at Seeger-Sunbeam Corporation, St. Paul, Minn.

Fitzpatrick to Renown Stove

William J. Fitzpatrick has assumed his new duties as foreman of the enamel department at the Renown Stove Company, Owosso, Michigan, according to a recent announcement by B. A. Nagelvoort, president.

Fitzpatrick goes to Renown from Newark, Ohio, where he was assistant foreman in charge of process and production control in the enamel department at the Newark Stove Company. His background includes 14 years of practical experience in all phases of ceramics.

New name for Ellwood Company

According to C. W. Carbeau, president of the Ellwood Company, Ellwood City, Pa., the company name will be discontinued upon completion of present plans and the company will operate under the name of the new owners, National Plumbing Fixture Corporation.

Pemco entertains foreign visitors

Pemco Corporation reports visitors during August from a number of foreign lands. From Santiago, Chile, came Mr. and Mrs. Marcos Pimstein, bride and groom, on a combined honeymoon and business trip. Mr. Pimstein is associated with Artefactos Sanitarios S. A., manufacturers of the famous "Artesanit" bathtubs.

The guest register was also signed by Jean Nicolin, associated with Etb. Japy Freres in Paris, France. His visit to this country is sponsored by the United States War Department in cooperation with the Porcelain Enamel Institute of Washington, D.C., in the interest of the Industrial Rehabilitation Program for France.

Manufactura de Tapas Corona, located in Barranquilla, Colombia, S.A., sent Mauricio Rozetti to this country to observe our methods as applicable to their manufacture of kitchen and general enamelware.

Also among the visitors was Bengt

to Page 40 →

Program

Porcelain Enamel Institute forum

Urbana, Illinois — October 9, 10 and 11

Wednesday Morning, October 9	Ceramic Building
9:00 a.m. Registration	
Visit to the Department of Ceramic Engineering	
11:00 a.m. Committee Meetings	(Specify room)
Wednesday Afternoon, October 9	Room 300
1:30 p.m.	Mathematics Building
Presiding	
Dr. A. I. Andrews	
University of Illinois	
Address of Welcome.....	(Rep. of University)
Response.....	R. H. Turk, Pemco Corp.
	President, Porcelain Enamel Institute
Symposium on Equipment for Cleaning and Pickling.....	W. N. Noble, Ferro Enamel Corp.
	R. D. Evans, Chicago Vitreous Enamel Prod. Co.
	(R. S. Sheldon, Frigidaire Corp.)
	(A. R. Mallonn, Republic Stamping & Enameling Co.)
	(Wade Willey, Nash-Kelvinator Corp.)
Thursday Morning, October 10	Room 300
9:30 a.m.	Mathematics Building
Presiding	
Dr. E. E. Marbaker	
The O. Hommel Company	
Three Methods of Gaseous Shielded Arc Welding —	
Atomic Hydrogen, Helium, and Argon.....	L. G. Pickhaver
	General Electric Company
The Value of Good Housekeeping.....	J. S. LeMunyon
	Tappan Stove Company
Safety in the Enamel Plant.....	David J. Hickey
	The Travelers' Insurance Co.
12:00 p.m. Group Photograph	
12:30 p.m. Group Luncheon	University Place Christian Church
Thursday Afternoon, October 10	Room 300
1:30 p.m.	Mathematics Building
Presiding	
W. N. Harrison	
National Bureau of Standards	
Research Tests and Test Methods.....	Dwight G. Moore
	National Bureau of Standards
Practical Test Methods for Shop Use.....	F. A. Petersen
	University of Illinois
Thursday Evening, October 10	Urbana-Lincoln Hotel
6:30 p.m. Banquet and Entertainment	
Address.....	R. A. Weaver
	Ferro Enamel Corporation
Friday Morning, October 11	Room 300
9:30 a.m.	Mathematics Building
Presiding	
Wayne Duvall	
Chicago Vitreous Enamel Prod. Co.	
Enamel Shop Production Problems	
(1) Use of Portable Conveyors.....	C. P. Kumlér
	(Mathews Conveyor Co.)
(2) Firing Ground Coats and Cover Coats Together.....	J. T. Irwin
	Clyde Porcelain Steel Corp.
(3) De-Enameling.....	Dr. G. H. Spencer-Strong
	Pemco Corporation
12:30 p.m. Group Luncheon	University Place Christian Church
Friday Afternoon, October 11	
1:30 p.m.	
Presiding	
Clark Hutchison	
Ingram-Richardson Mfg. Co. of Indiana	
Decorative Processes for Porcelain Enamel.....	H. D. Carter
	H. Draker
	B. W. King
	The Harshaw Chemical Company
New Angles on Reclaimed Enamels.....	B. J. Sweo
	Ferro Enamel Corporation
Symposium on Porcelain Enameling Non-Enameling	
Sheets.....	W. A. Deringer, A. O. Smith Corp.
	George Wiese, Florence Stove Co.
	D. S. Beal, The Youngstown Sheet & Tube Co.

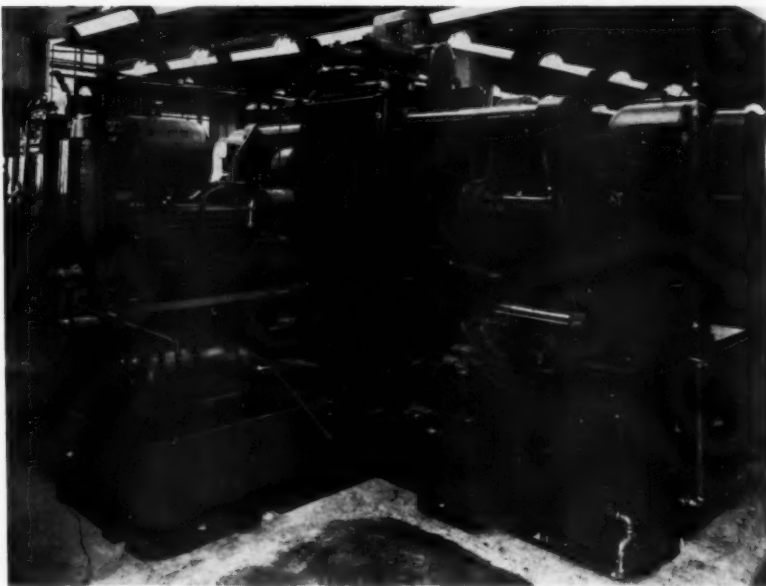
→ from Page 39

Hakansson, from Amal, Sweden, representing the Hakansson Industriels, manufacturers of porcelain enamel stoves. Each of the visitors came to observe the new and modern methods employed in American plants.

A plant to cost approximately \$1,000,000 for the manufacture of du Pont chemicals specialties will be built at West Toledo, Ohio, the company has announced.

The board of directors of Philco declared the first regular quarterly dividend of 93.75 cents per share on the Corporation's preferred stock, 3¾% Series A. The dividend is payable October 1, 1946, to stockholders of record September 14, 1946. A dividend of twenty cents per share on Philco common stock payable September 12 to stockholders of record August 31, 1946, was also declared.

This sixteen-ton giant performs fifty-two operations



That all-America bottleneck — retarded production — should be thrown for a sizeable loss, as far as the production of thermostats is concerned, through the installation at Robert-

shaw Thermostat Company's Youngwood, Pa., plant of this single-purpose machine, which turns out BJ thermostats in rapid-fire order. Range

to Page 48 →

Standardize your enamel slips with **ILLCO-WAY de-ionized water**

Leading ceramic plants are using De-ionized Water in the make-up of enamel slips, thus introducing one more uniform ingredient. Dissolved mineral impurities in all natural waters affect the flocculation characteristics of frit and clay suspensions. *De-ionization* removes the undesirable salts in the make-up water. When De-ionized Water is used in the mill room, *uniformity* of "set" of enamel slip is safeguarded.

Mineral-free water is yours with an ILLCO-WAY De-ionizing Unit. It will produce all the pure water your plant requires for capacity operation at 1% to 10% of the cost of distilled water. Maintenance is simple — no periodic dismantling for cleaning. Write for literature today.

THE POTTER can better control body and glaze composition with ILLCO-WAY De-ionized Water.

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De-ionizing Unit above: 250 gallons per hour. Other available units have flow rates up to 500,000 gph.

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A GOOD BOND should last a lifetime. In the wedding of porcelain enamel and metal the lifetime bond or durability depends so much on the ground coat enamel you use that extra attention should be given to the enamel, even though it may never be seen by your customers.

Some enameling plants depend upon Century for all of their enamels, ground coats, cover coats, acid resisting frits and special purpose enamels. Others who divide their purchases between suppliers have learned that it pays to depend on Century ground coats for the "lifetime bond" so important for continued customer satisfaction.

Plant operators like Century ground coat enamels for their workability and consistent results, P.A.'s

and management like them for their economical first cost and finished ware cost, and sales managers like them because they reduce complaints due to damaged enamel.

If you haven't tried Century ground coat enamels, don't let another week go by—order a trial shipment now.



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HAVE COLOR PROBLEMS GOT YOU IN A RUT?

THEN let Drakenfeld give you a lift. Our technologists have a wealth of experience in getting at the source of porcelain enamel color application difficulties and in finding ways to make and employ colors that keep the wheels of production turning out high-quality, profitable products.

This background and our complete research facilities are at your service — may help you out of a rut. Drakenfeld colors have pleased porcelain enamel manufacturers for many years and we believe they can save money for you. Whether you make signs or table tops, home, institutional or professional utensils and appliances, or produce architectural or industrial porcelain enamel, let us tell you all about the quality of our colors, the broad range of our facilities, and the practical helpfulness of our service. Write today.

DEPENDABLE SERVICE ON: Screening Paste . . . Graining Colors . . . Squeegee Oils and Mediums . . . Spraying and Banding Mediums . . . Chemicals . . . Rotospray Sifters . . . Porcelain Grinding Balls . . . Porcelain Mill Linings . . . Steveco Mills.

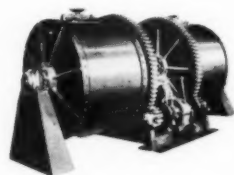


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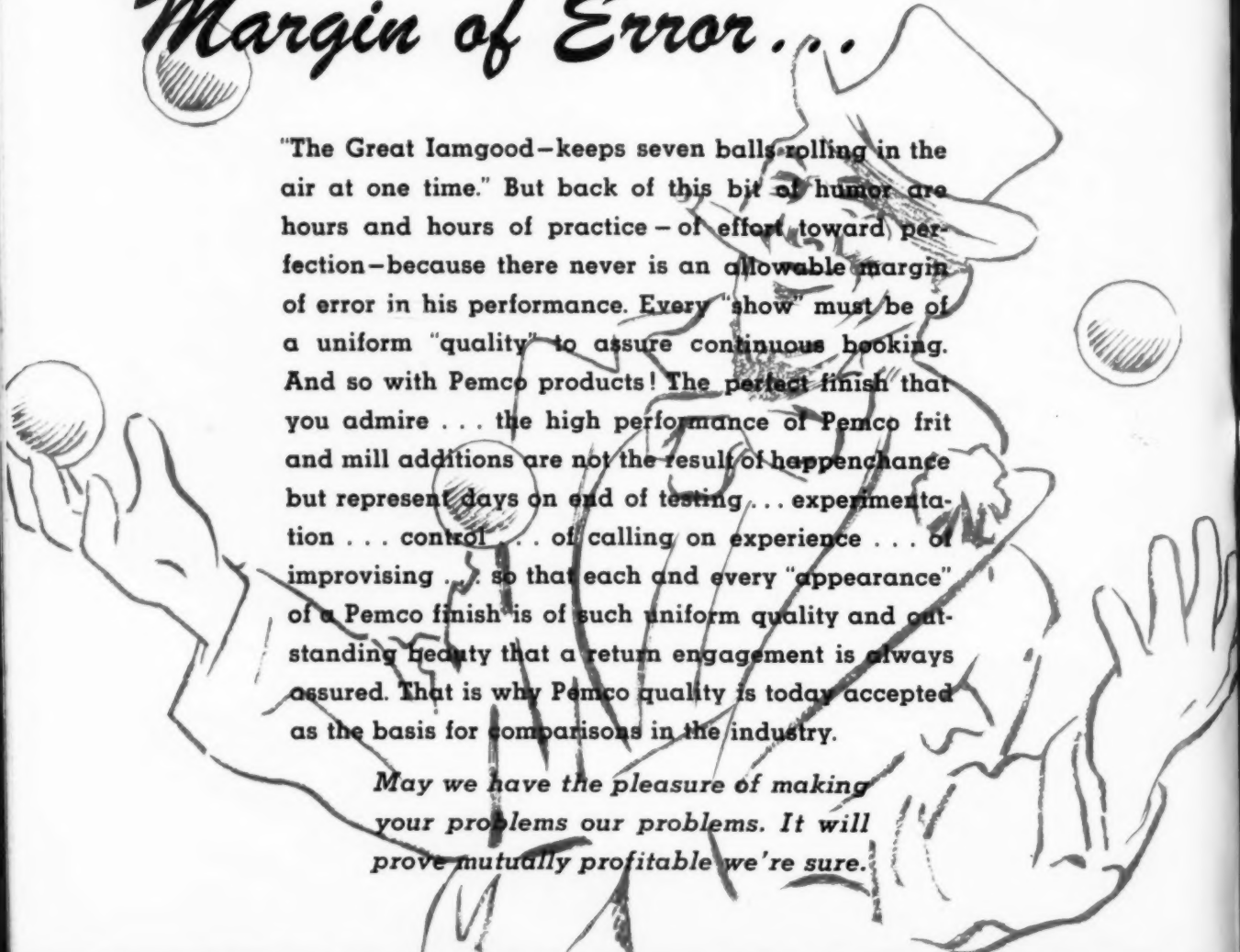
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Margin of Error...*



"The Great Iamgood—keeps seven balls rolling in the air at one time." But back of this bit of humor are hours and hours of practice—of effort toward perfection—because there never is an allowable margin of error in his performance. Every "show" must be of a uniform "quality" to assure continuous booking. And so with Pemco products! The perfect finish that you admire . . . the high performance of Pemco frit and mill additions are not the result of happenchance but represent days on end of testing . . . experimentation . . . control . . . of calling on experience . . . of improvising . . . so that each and every "appearance" of a Pemco finish is of such uniform quality and outstanding beauty that a return engagement is always assured. That is why Pemco quality is today accepted as the basis for comparisons in the industry.

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your problems our problems. It will
prove mutually profitable we're sure.*

PEMCO CORPORATION

BALTIMORE 24



MARYLAND

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America finds a new, easy way to save

OUT of the war has come one blessing—a lesson in thrift for millions of those who never before had learned to save.

Enrolled under the Payroll Savings Plan in thousands of factories, offices, and stores, over 27 million American wage earners were purchasing "E" Bonds alone at the rate of about 6 billion dollars worth a year by the time V-J Day arrived.

With War Bond Savings automatically deducted from their wages every week, thrift was "painless" to these wage earners. At the end of the war, many who never before had bank accounts could scarcely believe the savings they held.

The moral was plain to most. Here was a new, easy way to save; one as well suited to the future as to the past. Result: Today, millions of Americans are continuing to buy, through their Payroll Savings Plan, not War Bonds, but their peacetime equivalent—U. S. Savings Bonds.



From war to peace! War Bonds are now known as U. S. Savings Bonds, bring the same high return—\$25 for every \$18.75 at maturity.



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New homes to own! Thousands of new homes, like this, will be partially paid for through Bonds wisely accumulated during the next five to ten years.



Keeping cost of living in check! Buying only needed plentiful goods and saving the money which would bid up prices of scarce goods keeps your cost of living from rising. Save automatically—regularly.

Weekly Savings	SAVINGS AND INTEREST ACCUMULATED	
	In 1 Year	In 10 Years
\$ 3.75	\$195.00	\$2,163.45
6.25	325.00	3,607.54
7.50	390.00	4,329.02
9.38	487.76	5,416.97
12.50	650.00	7,217.20
15.00	780.00	8,660.42
18.75	975.00	10,828.74

Savings chart. Plan above shows how even modest weekly savings can grow into big figures. Moral: Join your Payroll Savings Plan next payday.

SAVE THE EASY WAY...

BUY YOUR BONDS

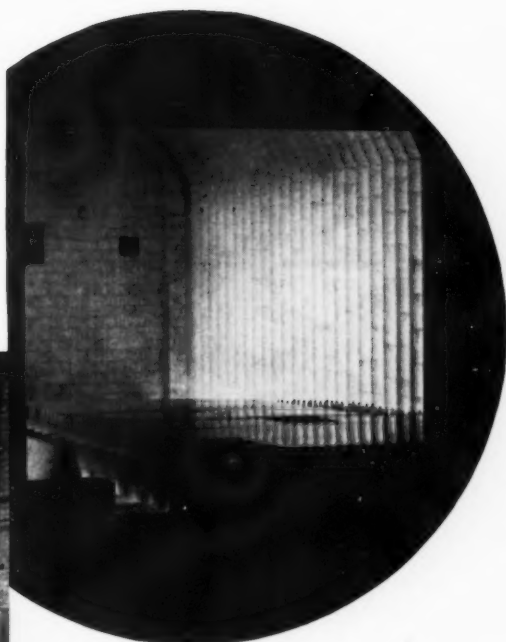
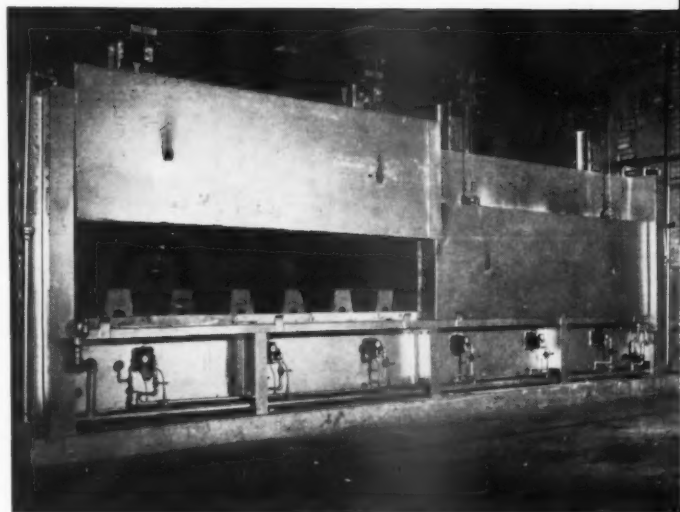
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- ★ ★ ★ Years of practical experience in the construction of long-life furnaces and smelters of all types are represented in the Huyck organization. All jobs are handled by skilled masons who know HOW to build structurally sound, long lasting jobs.
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ELMWOOD PARK, ILLINOIS

→ from Page 40

manufacturers and appliance dealers will be glad to learn that the output of thermostats will be greatly increased by the features of this new machine which weighs sixteen tons, performs fifty-two operations, and has a manpower ratio of 64 to 1.

Emmett Hershey dies

It is with regret that *finish* reports the death of Emmett Hershey, West-

inghouse Electric Corp., Mansfield, Ohio, on August 26.

Mr. Hershey was born in Mansfield on May 29, 1891. He attended Ohio Northern University, at Ada, and, following graduation, taught school in the country.

In September of 1922, Mr. Hershey joined Westinghouse, Pittsburgh, as an inspector. In 1926 he went to Mansfield on inspection work, and from 1926 through 1942 was man-

ager or general foreman of the vitreous enameling plant. In 1943 he was transferred to the industrial relations department, where he trained employes for aircraft work.

George Grimes to Gibson

It is reported that George Grimes, formerly enamel shop superintendent at Florence Stove Company, Kankakee, has joined the Gibson Electric Refrigerator Corp., Greenville, Mich.

Chief engineer for Ohio Tramrails



John W. Baer, recently returned from three years service in the Army Engineers with the rank of Captain, has been appointed chief engineer for The Forker Corporation, Cleveland, Ohio, manufacturers of the Ohio Tramrail Systems.

Mr. Baer is a graduate of the Engineering College of Cornell University. Prior to his Army Engineers' service, his industrial engineering work was exclusively in the material handling field, covering the design of equipment and manufacturing production. Before entering the service, he served in the capacity of tool engineer and chief draftsman at Forker.

Roper executive retires

Otto H. Olson, vice president in charge of production of the Geo. D. Roper Corp., has announced his retirement, effective October 31. He has been a prominent figure in the Roper organization for over eleven years.

to Page 50 →



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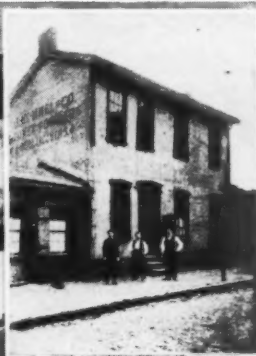
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● BRONZE POWDERS
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● SUPPLIES
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Our Technical Staff and Samples are available to you without obligation. Let us help you with your problems.

→ from Page 48

Mr. Olson explained that his retirement is part of a plan he set up several years ago. In his own words he stated, "Now that the Geo. D. Roper Corporation has been reconverted from war-time to peace-time production and is in excellent condition to maintain its position in the appliance industry, it is my desire to step aside and start enjoying many of the things I've been putting off for years."

Joseph Boyce has been employed by Titanium Alloy Mfg. Co. as associate ceramist. Boyce's background includes ten years of experience in frits and glazes as well as extensive work in the field of ceramic colors.

Battelle to appoint Graduate Fellows and Research Associates

For the year beginning in the fall of 1946, Battelle Memorial Institute, Columbus, Ohio, will appoint a limited number of Graduate Research

Fellows and Postdoctoral Research Associates to conduct investigations of a fundamental character in the Battelle laboratories. This is a part of a training program which has been in operation at Battelle since 1931.

Associates and Fellows are brought together for a year's "internship" at Battelle for the purpose of developing highly trained research men, primarily for careers in industrial research. Appointees devote their full time to their own research projects in the Battelle laboratories under the guidance of the Battelle technical staff. The projects must be of a fundamental or general nature, leading to the discovery of scientific principles or the gathering of significant new data. The findings are to be prepared for publication as a service to science and industry.

Reid advanced at Florence Stove

A report comes to *finish* that Harry Reid has been advanced to the position of enamel shop superintendent at Florence Stove Co., Kankakee, Ill.

Davies joins Ingersoll Steel

Effective September 16, Tom Davies joined the Ingersoll Steel Division, Borg-Warner Corp., Chicago. He will be in charge of the second shift. Davies was formerly with Altorfer Bros. Company, Peoria, in the enameling department.

Better goods at lower prices

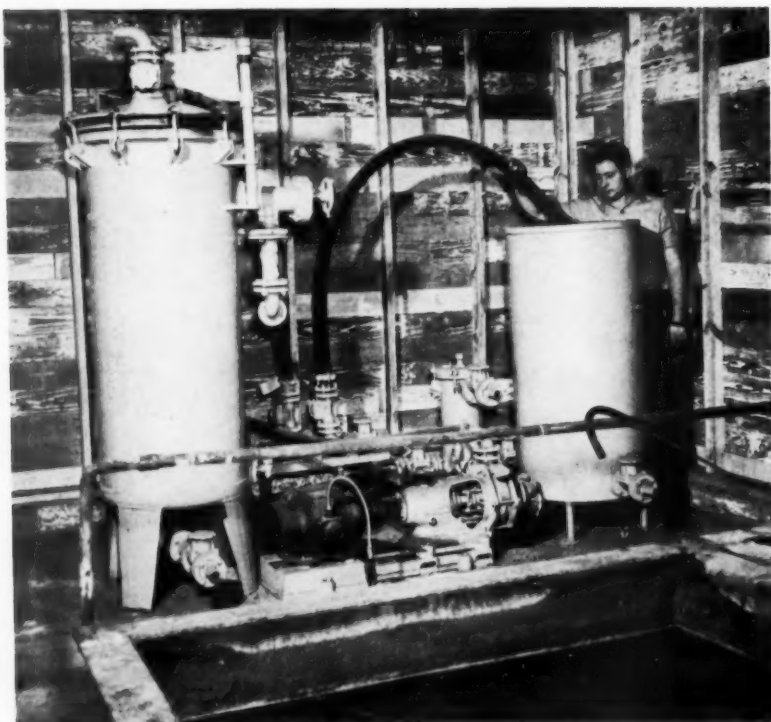
"Better goods at lower prices while paying higher wages" was announced as the theme of the Semi-Annual Convention of the American Society of Tool Engineers by President A. M. Sargent.

He said the Pittsburgh gathering October 10-12 will consider "the major problem facing tool engineers and industry today. Our general program and the technical sessions to be held coincident with the Convention are designed to help solve this problem.

Sargent pointed out that an anticipated 2,500 engineers from 48 states and Canada, plus foreign representatives, will exchange knowledge accumulated in changing over from war

to Page 60 →

INDUSTRIAL PRESSURE FILTERS — A MUST FOR MODERN PICKLE ROOMS



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Central district enamellers

enjoy clam bake and golf

Painesville Country Club, Painesville, Ohio, was the scene of the first fall meeting of the Central District Enamellers Club, Saturday, September 14. Scheduled as a social "Get-to-Gether," the meeting included golf, a clam bake, chicken dinner and a lot of "chewing the fat." Judging from comments from those present, the meeting was considered a big success and a welcome prelude to the more formal meetings to be held later in the season.

For golfers, or "would-be" golfers, the course at Painesville offered a challenge to accuracy and physical stamina. Those who finished 18 holes and came in under their own power should rest assured that they will be good for many, many long years of enameling activity. The course has many "picture holes" that would make excellent illustrations for a sports magazine. It was suggested, however, that the man who laid out the course must have either planned it as a refuge for mountain goats or to remind him of his home in the Swiss Alps—certainly never for a group of porcelain enamellers who work for a living and play golf for "recreation."

If it hadn't been for the difficulty of keeping track of a little white pill your reporter would have many interesting incidents to cite. Bob Evans was accused of playing billiards instead of golf when a powerful hook to the woods took a beautiful bounce off a couple of trees to put him in position for an easy par. Lew Hart started home for a gun when one of his "power drives" sent a rabbit scurrying for shelter. Your reporter came up over one of the many hills, after getting his one good spoon shot of the day, to find his ball on the green for an easy par only to be told that a member of the gallery—Dick Guthrie, to be exact—had "helped" the pill on from 15 feet off the green.

Now we know the habitat of that rare bird known as the Side Hill Gouger. For those uninformed, the Side Hill Gouger is a species of non-flying bird with one leg only half the length of the other. This phe-

nomenon is said to have resulted from walking constantly on the side of steep hills. They have great speed and have never been caught while traveling with their long leg on the down-hill side. On rare occasions the bird has been known to become excited and inadvertently turn so that the shorter leg is down hill—he is then a helpless prey for any hunter.

Weary golfers were quickly brought back to life with clam broth, great quantities of energy building clams, and an honest to goodness chicken dinner.

The "Get-to-Gether" was an excellent send-off for a new season. We will be looking for big things from the Central District Club this winter, when the conversation turns to "one coat whites" "spray systems for cleaning steel," etc. *Finish* will keep you informed.

You gain **QUICK** dealer acceptance
with
ROBERTSHAW
oven heat control



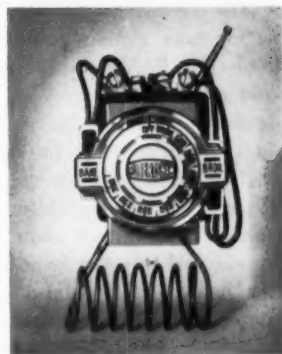
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Robertshaw models include thermostats for dressing sterilizers, autoclaves, incubators, electric and oil ranges, ovens, water heaters, laundry machines, deep-fat fryers, coffee urns, food carriers, chicken brooders and many other uses. Write for full information.



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Science looks ahead

(Continued from Page 24)

ent it costs about \$100,000 a pound but it will certainly come down, and when it comes to \$6,000 a pound it will be cheaper than coal. By that I mean that a dollar's worth will give more power than a dollar's worth of coal. The reason for this is that one pound of atomic fuel gives as much energy as 1,500 tons of coal. If this fuel is brought under control, and if in five or ten years its cost comes down to this level, it could well make the entire coal and oil industries obsolete and would, besides, have an enormous effect on the railroads because so large a part of railroad earnings come from the hauling of coal. It would, however, not affect the ordinary consumer much because in his case the cost of power, of whatever sort, is about 9/10th the cost of distribution and 1/10th, or less, the cost of fuel itself. So, when this time comes, large power houses are likely to profit — but not the ordinary consumer.

The third stage of needed research is to make atomic power safe and foolproof. This seems a long way off and may take twenty years or more because, at present, no one has any idea how to prevent those deadly rays that are emitted when the atom explodes. If that problem, too, is solved, then we may some day have atomic fuel in pellet form to be used for house heating, farm operation, automobile propulsion, etc. But that time is far off — perhaps in the year 2,000, and not worth thinking about today.

With respect to the appliance industries, there are several developments worth knowing, especially in the so-called soft plastics. This is a better term than synthetic rubber. Our capacity for synthetic rubber production is now 50% greater than our former imports of natural rubber, and since natural rubber is also coming into the country there is excess productive capacity which will be used for all sorts of textile substitutes. Excellent, thin sheets of various soft plastics will become popular as substitutes for textiles in outdoor

garments, upholstery, tablecloths and bedspreads, wall coverings and floor coverings. A very large growth is anticipated here, and since these textiles can be wiped off, there may be a reduction in the amount of laundry business. This may be compensated by an early development in the field of soft plastics, namely, the impregnation of fabrics and textiles with soft plastics to make them flameproof, shrinkproof and waterproof. Perhaps the outstanding developments here are the processes developed for the treatment of wool and wool fabrics so that they do not shrink and are not affected by water or by soap and water. This would seem to mean that woolen garments can be laundered instead of being dry cleaned.

Other advances of wartime science

From the point of view of the general market, there are several other advances of wartime science that should be watched. In medicine, for instance, the development of DDT as a preventative of insect-borne diseases like typhus and malaria, the use of blood plasma, sulfanilamide and penicillin saved something like 100,000 lives during the war. They do not save the lives of civilians, but they do postpone their deaths — by about ten years. This means that life expectancy in this country has jumped from 65 years to 75. It means that most youngsters in school and under 20 years of age will live to see the year 2,000, and all that implies. It means that by 1960 we shall have 20,000,000 people in this country 65 years of age or more. *Think of what that means to the Republican Party!* Think of what that means in terms of a new market, of 20,000,000 people who have had a life time of earnings, on social security if nothing else, who thus have money to spend and time to spend it. It is a big new market that many manufacturers are counting on, especially in Florida and California.

Still another field worth mentioning is the remarkable development of

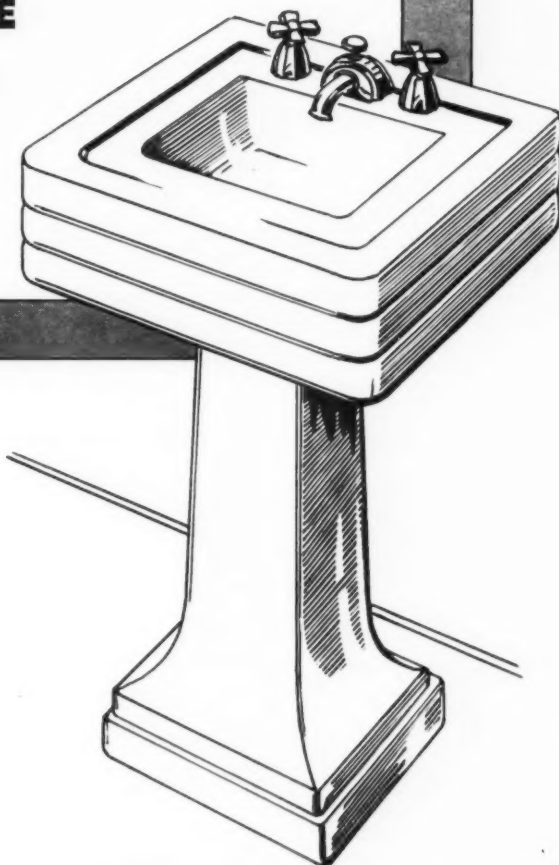
electronic instruments. I have already mentioned some, but even more important are such devices as the "automatic pilot" and the "invisible crew." If a great bomber can be operated with automatic controls, then almost any factory in the country can, too. It seems to me that when the present labor unrest dies down and we do get back into full production, there will be a rapid installation of automatic controlled devices of all sorts. The net result will be more and more production, with less and less labor requirement . . .

Women do not buy washers, dryers and ironers (and other household appliances) in order to increase production, nor to increase profits. They buy them in order to save labor and to earn time. Time is the profit they want — time to live. I rather think that in the not too distant future men, factory men, industrial purchasers, will buy machines for the same purpose — not merely to increase profits, but to earn time for themselves and for their staff, and for the whole group that is known as "labor."

We run into needless trouble because we do not anticipate the long range social and economic consequences of scientific and technical advances. This seems to me inexcusably stupid, for it is not difficult to watch what is going on in the laboratories. In the short space at my disposal, the best I can do is to call to your attention this tremendous social power of science and to urge you to read a book on the advances of science at least once a year and, also, to pick up a science magazine whenever you can to keep up with the times. And — most important of all — whenever you read of a new invention or process, ask yourself what will it do to us and what shall we do about it. What this country needs most of all is the realization that science is a tremendously powerful social force that must enter into every businessman's calculations.

"Science Looks Ahead" was adapted for finish, by the author, from a talk before the American Washer & Ironer Manufacturers Association's July meeting, French Lick, Indiana.

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"Incidentally, you will be interested in knowing that we received an inquiry from Paris, France, this week, telling us that they had seen our ad in *finish*."

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"I am highly pleased with the magazine as it is a fine interpretation of the enameling field . . ."

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"We have pleasure in attaching herewith our draft for five dollars for (1) year's subscription to *finish*, and would be pleased of your acknowledgment in due course."

BASSANO del GRAPPA

"We have been very much pleased to receive the *finish* magazine, January, 1946. Please go on forwarding the *finish* to our address and let us know the subscription rate . . ."

Santiago

"Your *finish* magazine is very interesting for every person that works in the enameling industry. Its articles bring a lot of knowledge; ideas; that are very useful, specially in Chile where the industry is little and develops in a different way than in your country. I appreciate *finish* very, very much."

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"We have at various times recommended your publication of *finish* to several of our customers . . . We thought . . . you would be pleased to know that *finish* is receiving such a wide circle of interest."

LOS ANGELES

" . . . the splendid magazine you are getting out. It is most worthwhile and has certainly added much information on porcelain enamel which otherwise would not have been obtained."

Europe's prewar enameling industry

(Continued from Page 16)

production of electro-kitchen utensils, with extra heavy flat bottoms which fitted exactly the electric kitchen ranges. "Sphinx" electro-kitchenware was one of the first on the market.

The extra expensively decorated ware needed up to 5 and even 7 decoration burnings on hand made designs, and also high class routine decorating work. One of the first in Europe, they applied the screen method for their expensive multi-colored sign plates.

Editor's Note:

The author of this article was for 12 years works manager of the plant in Nebocady, and during the last two years before his leaving the country with the events of Munich, simultaneously in charge of the Brno plant.

The bath tubs were burned on an electric muffle furnace, as the Czechoslovak output in this line was restricted to 50 to 60 bath tubs a day, and thus did not justify a continuous furnace for this purpose alone.

The company's "Elite" and "Sphinx" brands were world known and in prewar times largely imported to this country. A large number of hospital items of all shapes were also an important part of the manufacturing program.

The production was not "streamlined" like the Nebocady plant as the variety of items did not permit such installations. They had, however, also their own power plant, gas producer, continuous drying and burning equipment, rotary smelters and so forth. The best proof of the split variety is the fact that at one time the color palette of this plant was so complicated that the mill room had to take care of not less than 250 various shades of all colors human fantasy could imagine!

Of a certain interest it might be that the management of the plant that was proud to have achieved highest acid resistance and very good other properties, believed for many years that their special enamels could

only be fritted in crucibles. For this purpose they operated a smelting furnace containing about two hundred single crucibles which were automatically charged, before the plant, at long last, switched over to the use of rotary smelters.

The Slovakian plant in Filakovo

This plant was an average one, producing besides enameled utensils, stoves, and some enameled cast iron items, various other lines like galvanized and tinned ware. Nothing special has to be reported on the enameling department of this factory.

The drawback of the "Sphinx" company's organization as a whole was the fact that all plants with exception of the works in Brno (Brunn), but also including the other localities of production and the plants turning out tin cans, were placed in towns near the borders of Czechoslovakia. In 1937 an idea, therefore, was studied to centralize the entire enameling output in one huge super-modern plant in the center of the Republic, away from the political influence of the border population of German and Hungarian descent.

This plan, however, could not be materialized as Hitler broke Czechoslovakia into pieces by the strange happenings at Munich, and established his so-called "Protectorate" only a few months afterwards. What his hordes have done to that country and how much the population had to suffer during the occupational terror is only too well known today.

The company has lost the plant in Filakovo, the famous factory in Brno is entirely destroyed, like the whole town of Brno, a victim of the heavy fighting of the Red Army against the Germans when the victorious Russians entered the Moravian corridor after the conquest of Vienna.

The only enameling plant left intact to the "Sphinx" today is Nebocady, which after the liberation of Czechoslovakia from the German yoke became re-established soon and operates today with about 350 in-

stead of the 1600 workers in the "good old days."

With the end of the war many members of the former staff have disappeared, became victims of justice, or were expelled from Czechoslovak soil for political reasons. The present management consists again of old reliable members of the company, some of them have even returned from the ill-famous German concentration camps. Like all larger Czechoslovak Industries, the "Sphinx" is today nationalized and operated by the Czechoslovak Government.

Firing principles

(Continued from Page 18)

temperature. This would lead to unequal heating of the ware and a burning off of the enamel in some places, while on other parts of the ware it would not be fused down.

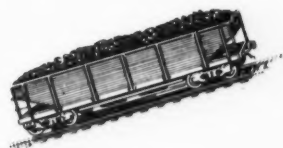
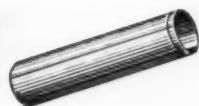
In charging a box type furnace, the load of ware drags the furnace temperature down and considerable time is required to heat the load and again acquire temperature. This time period is called the comeback of the furnace. It is not desirable to force a furnace firing cast iron ware. For example, a light or medium load of uniform ware might fire in twelve minutes. To force heat into a furnace with a heavy load of non-uniform ware would result in uneven heating and over and underfired enamel. A continuous furnace offers much better conditions for firing cast iron ware as the ware is preheated and enters and leaves the hot zone gradually. This helps to avoid warping which is more likely to take place in a continuous furnace where the ware is preferably hung instead of being placed on points.

The production capacities of box and continuous furnaces are shown in Table III.

(4) Hansen, *Manual of Porcelain Enameling*, Ferro Enamel Corp., Cleveland, O.

Over eighty years have passed since porcelain enameled ware came into use in America. The utensils were introduced in 1861 and have been used extensively in homes, hospitals and institutions.

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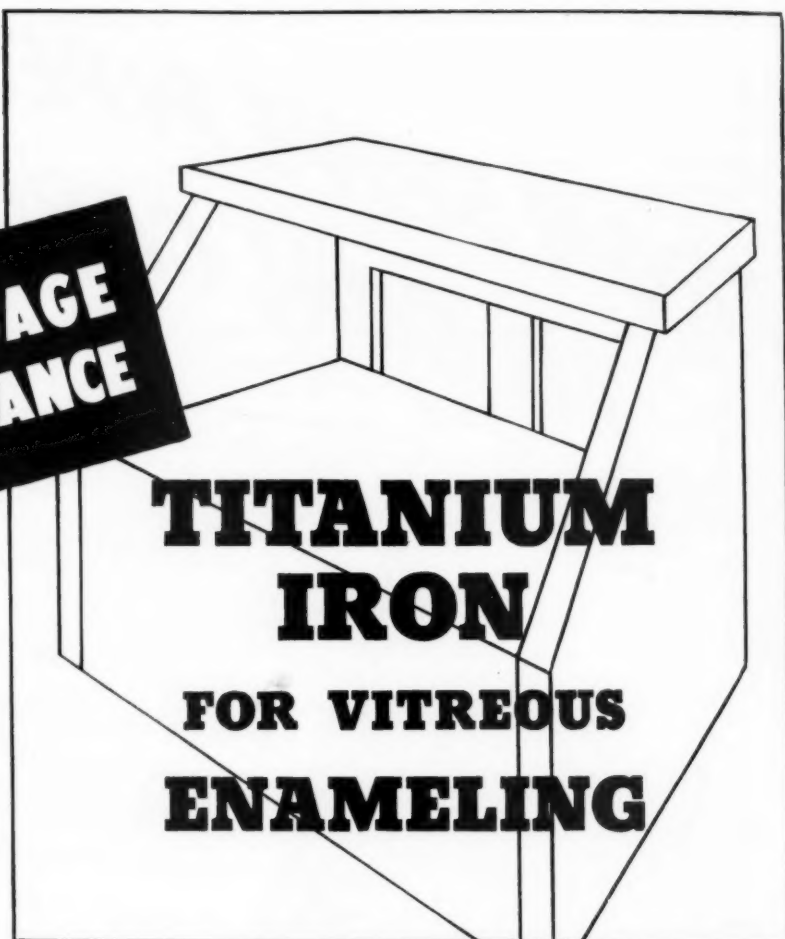
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SAG RESISTANCE**

ENAMELED WARE of lighter gage stock can be fabricated to desired shapes and retain a better appearance because of the increased sag resistance of Titanium iron for vitreous enameling. This particular feature is clearly demonstrated on chart at right.

Another feature is the elimination of formerly necessary ground coats. For—under proper shop conditions—the cover coat can be applied directly to the base metal. Also, these thin finishes reduce the hazards of chipping and breaking. Furthermore, at enameling heats, there is no sign of enamel boiling. During three years of both research and production experience, no case of fish scaling has been reported.

Further information is available upon request.



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GAGE AND COMPOSITION	DEGREE OF SAG IN %
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24 Ga. Titanium Steel	57
18 Ga. Standard Enameling Iron	100
18 Ga. Titanium Steel	18

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